Telephony.

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A Patriotic Creed.

Whether from choice or policy, it is apparent that the money interests of the country are showing a more kindly spirit toward the nation as a whole. Most people hold the opinion that it is a case of compulsion. The trend of the times is decidedly in favor of giving "the other fellow" more consideration. The feeling that riches and power are not everything in life, and that, especially, they are not the divine right of the few to use in subjugating the many, is growing stronger every day. Whether or not this is due to the belief of "big business" that such a condition could not continue much longer and that wisdom called for a lessening of the pressure, the fact remains that there is a marked change of sentiment, for all of which we should be thankful.

In this connection a handsome placard sent out by the Chase National Bank of New York, furnishes a case in point. The banker, by the way is seldom considered a very striking example of "good will to men." Readers of TELEPHONY will recall that Kelsey's vigorous pen has frequently reminded them that the average banker has a ledger for a heart and a trial balance for a soul. Consider, then, the following declaration of this big New York banking house, distributed over the country under the caption, "A Patriotic Creed."

"We believe in our country—the United States of America. We believe in her constitution, her laws, her institutions, and the principles for which she stands. We believe in her future—the past is secure. We believe in her vast resources, her great possibilities—yes, more, her wonderful certainties.

"We believe in the American people, their genius, their brain, and their brawn. We believe in their honesty, their integrity and dependability. We believe that nothing can stand in the way of their commercial advancement and prosperity.

"We believe that what are termed 'times of business depressions' are but periods of preparation for greater and more pronounced commercial successes.

"We believe that in our country are being worked out great problems, the solution of which will be for the benefit of all mankind."

Of course, this does not mean that a man could rush into the Chase and borrow $100,000 on the creed, but it is rather encouraging to note such sentiments emanating from a bank. It is a straw that shows the wind has shifted a little anyway.

Telephone Lines on High Tension Poles.

During the past few years, electric utility companies have found the telephone of invaluable assistance in the carrying on of their business. Power companies, operating a chain of power plants and substations, have found that telephone facilities are quite essential to satisfactory furnishing of service to the various localities in the territory in which they operate. Many of the companies have their own private telephone systems, while others lease circuits from the telephone companies. In the case of the privately owned systems, the wires, in many instances, are run on the same poles as the power wires, the voltage on which is sometimes as high as 60,000 volts.

With the extension of electric railways into systems with a network covering a large area, the telephone was selected as the most efficient aid in the operation of cars and power stations. Accordingly, circuits were strung upon the trolley, feeder and high tension poles along the railway right of way. These circuits were to be used mainly for two purposes, the dispatching of cars and the operation of the power plants and substations.

Naturally the placing of the telephone wires on the same poles with the feeder and high tension wires caused more or less difficulty in holding satisfactory conversation, and many experiments were necessary before the noise on the circuits was reduced sufficiently to permit of the circuits being used. But the various difficulties have been overcome and many companies, both power and electric railway, now have private telephone systems on the same poles with high tension wires and obtain quite satisfactory service. The article by Wm. D. Cleveland, which is concluded in this issue, describes the installation of a telephone train dispatching system for a large electric railway, and points out the methods by which satisfactory telephone service was obtained.

The Five Thousand Dollar Office Boy

By HERBERT KAUFMAN

The world can find plenty of men to handle its big jobs. No trouble now-a-days to get folks who'll snip an isthmus, or move a mountain, or tunnel a river for you. The erection of a sixty-story skyscraper, no longer excites our imagination. Accomplishing impossibilities is an every day trade.

We are thoroughly equipped for Titan tasks. We carry a full assortment of trip-hammers, and steam shovels, and subway drills in our tool kits.

If you can pay the bill, there are a thousand quiet, bespectacled gentlemen who will seriously undertake a transcontinental tunnel, or a fifty-block hotel.

Big figures don't frighten us—modern arithmetic specializes in tremendous calculations. The new civilization dares to achieve what yesterday feared to dream.

The giants have come back to earth. Cyclops is roaming the universe. His stature, however, is a dimension of brain instead of brawn.

There are a hundred markets from which we can secure competent wizards. There's a glut of leaders and generals.

The school of progress is educating enough merchant princes, engineers, inventors, and scientists, to cope with the demands of the time, but we are short on office boys.

We lack folks who'll do small things in a big way. There is a weak link in our chain of organization. We pay too much for errors. Their cost is pro rata to the scale of our calculations.

We have been so eager and absorbed in the perfecting of driving wheels and gears, that we have forgotten all about the bolts, nuts, and screws. And this very disregard of seemingly trifling details has magnified and multiplied their opportunities to create harm and play havoc.

A minor mind becomes negatively powerful the instant it is permitted to assume a responsible obligation in a vital undertaking. The moment a valuable letter is entrusted to an errand boy, for the time being, he becomes the most important factor in the series of operations which have culminated in the communication delegated to his care. If he fails to promptly and precisely fulfill his orders, all the effort, ingenuity and intelligence antecedent to his entry into the situation, are jeopardized.

Special trains of thought are regularly derailed by the assinine interruptions of incompetent underlings. Long established and profitable accounts are daily lost by bungling employes.

Watch your little people! You are apt to underestimate their capacity for damage. Because they cannot create, you are liable to forget their power to wreck. A crawfish cannot build a dyke, but it can dig a hole that will destroy one.

A half-wit isn't capable of construction, but he can do a mighty lot of tearing down. The vandals could not raise a Rome of their own, yet they laid waste the city on the "Seven Hills."

Turn your attention to the lower ranks of your organization and safe-guard yourself against the further depredations of ignorance and shiftlessness.

Investigate your debits and trace their source, and you will be staggered at the real size of a certain section of your payroll. There are ten thousand institutions in America immediately in need of men and boys who fill five hundred dollar jobs in a five thousand dollar way. If you can get one at the price, don't haggle— he's worth the money.

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Governmental Ownership of the Telephone Lines

Analysis of Past as Indication of the Future—Telephone Development in United States and Other Countries—Pertinent Inquiries Relative to Government Ownership—Address before Republican City Club, New York, in Reply to Congressman Lewis

By D. A. Reynolds

As I try to determine the future by an analysis of the past, I see this republic drifting further and further from the conception of its founders, and I wonder if the prophecies of the old world shall find their fulfillment in our downfall. From a confederacy of states, composing the units of the republic, in which all rights were reserved to the states except those directly delegated to that federation, we have seen a steady march toward centralization, until the former policy has become obscure, and the central government supreme. Under this ever increasing power, ambitious men have grown restless of restraint, bid defiance to precedence, taken to themselves the prerogatives of government, and scoffed at the limitations prescribed by our "Magna Charta."

The Tendency to Disregard Constitutional Restraints.

In the language of Samuel W. McCall, for 20 years congressman from Massachusetts, "We have reached a point where the national government feels itself justified by popular sentiment, in leveling a federal edict against any acts which displeases it, with but slight reference to the existence of constitutional restraints."

Like the giant whose untried strength cries out for activity, we are looking for new fields to conquer, and failing in our quest, are opening an assault upon the very foundation of our greatness.

To my mind, such a course is fraught with untold dangers. The moment you convert your representative into a "business agent," that moment you have imposed upon capital the principle of taxation without representation; management without responsibility; driven it from the field of legitimate enterprise, and prostituted statesmanship to the exploitation of new schemes for personal aggrandizement. The principle of government by the consent of the governed will have given place to dominant bureaucracy; respect for law will have given place to fear of law; encouragement will have been superseded by intimidation, while all the distinctive demarkations between our beloved republic and the dynasties of the old world will have vanished.

But there will be one certain source of satisfaction when the government operates the telephone. We shall have "military precision." If the theory of governmental ownership shall prevail, we will know exactly where to register our complaints. If the telephone operator does not give us, in record time, the number we call, all we will have to do is to call up Corporal Black, and ask him to request Sergeant Brown to notify Captain Green to call the attention of Colonel White to the necessity of notifying General Bluebeard to communicate with Postmaster General Burleson, who will, of course, immediately order General Bluebeard to instruct Colonel White to transmit, through Captain Green, his assurance to Sergeant Brown and Corporal Black, that our mild protest will soon have the attention of a congressional investigating committee. How fascinating to the average business mind, is the simplicity of military precision!

Incompleteness of Telephone Statistics.

We all regret the incompleteness of statistics affecting this comparatively new industry, and the necessity of "guessing" at results. A fair illustration of this incompleteness is the so-called "table of efficiency" used by our distinguished friend in his argument, before the committee of the whole, on January 16, in which the average capacity for an operator is placed at 20 connections per hour in this country, and as high as 50 per hour in the government owned system of Norway. The fact is, that the average capacity of an operator in New York City is 125 per hour, while the most modern system now in use in Ashtabula, Ohio, shows an efficiency of 624 connections per hour. This is 12½ times the capacity of the highest efficiency given in the table referred to, showing its absolute unreliability.

To a degree, nearly all the deductions of that remarkable discourse have been laboriously, but conscientiously formulated from insufficient data. In the consideration of a question of such national importance, there should have been taken into account, the size of the country; the density of population; the consanguinity of trade relations; the relative efficiency of wire and postal facilities; transportation facilities requiring ordinary or electrical communication to facilitate proper handling of consignments; the effect of mixed or varied languages; and the relative wealth of the respective communities—all elements of the utmost importance.

The question of efficient service must always depend upon the efficiency of the employe. The stream can never rise above its source. The government employe, whose status in life is fixed through civil service regulations, can never have the incentive to excel that pervades all well regulated corporations. Men who seek governmental employment are not the men who work out the progress in any of our great industries, while those not protected under civil service regulations, find it necessary to divert their attention from governmental business to party politics, in order to retain their positions. This fundamental principle is too well known to call for more than a reference in passing.

Questions to be Considered.

I cannot help but feel, however, that our friend should have given us a few of the figures on the other side of the balance sheet. I would like to know how much this beautiful theory of government ownership is going to cost us. Are we expected to make up a deficit each year, burdening the whole of our people for the accommodation of a few? Are we so zealous of a deficit in our post office department, that we cannot survive the theory that at least one department of government may be self-sustaining?

But we are told that the government does not contemplate taking over the whole system; that real estate constitutes 40 per cent. of the investments of the telephone companies, and that the surplus from the parcel post will pay the fixed charges on the initial investment. This, in itself, is a confession of weakness, and shows the desperation to which the advocates of governmental ownership have been driven. It smacks loudly of the financial policy of the New Haven railroad, and will prove equally as disastrous. Why impose upon the users of the parcel post the burden of non-profitable telephone service? If governmental ownership is correct in principle, no subterfuge is necessary. If it is intended to create a subsidy to the telephone users of this country, why not say so in plain words? If the small initial expenditure is simply to get the camel's nose inside the tent, let us know the full size of the body before admitting it.

Telephone systems have never been operated without central offices, and those offices are not located in air-castles. If the government does not take over the real estate, it will be compelled to lease it, and you can rely upon the certainty that the rentals it will pay will not tend to cheapen the cost of the service. Then again we are promised a reduction of 33⅓ per cent. when the postoffice shall become our messenger boy. But with one of the telegraph companies paying 4 per cent. and the other 3 per cent. on its investment, I see little room for reduction. Even the substitution of postage stamps for currency cannot effect the saving promised.

But where does this idea of government ownership spring from, and what are we to profit by its adoption, except a few more government sinecures? Is it an English idea transplanted to American soil? London has but 40 per cent. as many telephones as New York, while the entire British Empire has but 700,000 telephones. As compared with this, we have fully 9,000,000 telephones, not one of which has ever been subsidized. The development of Great Britain in this line has been 5.5 per cent, while our development has been over 66 per cent. This country, under the invigorating stimulant of competition, has more than twice as many telephones as all the rest of the world combined. Why should the 66 per cent. surrender to the 5.5 per cent.? If Great Britain finds it necessary to charge up a deficit of $5,000,000 a year on 5.5 per cent. of the telephone development of the world, what would be our deficit on 66 per cent.

But notwithstanding this excessive cost under government ownership, her service is slow and unsatisfactory. The most modern system of telephony is able to complete a connection in 2.4 seconds. New Yorkers, with a system 20 years behind the art, are accorded a connection in 24.8 seconds. The English system under government ownership shows an average as slow as 51 seconds.

It is said that in Paris a connection can be made very much quicker than in London, especially if you speak French. I do not know how this is. If our friend has any data or experience in French efficiency, he will doubtless enlighten us.

Monopoly as a Blight Upon Progress.

It has been the experience of years that monopoly—and I see but little difference between *public* and *private* monopoly—acts as a blight upon progress and inventive genius in every line its withering hand touches. In the language of the scholar and statesman, who stands at the head of this government, "Wherever there is monopoly, not only is there no incentive to improve, but, improvement being costly, in that it 'scraps' old machinery and destroys the value of old products, there is a positive motive against improvements."

Apply this logic to the telephone, and it will show us the blight that must fall upon this great utility. With 16,000,000 homes and 7,000,000 places of business yet deprived of its benefits, we cannot afford to close the door of progress and bid defiance to the march of civilization. This industry is in its infancy, and must not be strangled in order to give place and position to another commission, and a new horde of government employes. Fortunately, there is little danger of this innovation. For 17 times Congress has resisted this alluring rainbow of promise, and it is not likely that it will be seriously considered until there shall arise a well organized public demand.

We are essentially entering a new field of untried experiment, in which the experience of the past is of but little value. It is true that the postoffice department has shown ordinary efficiency since the master hand of John Wanamaker placed it upon a business basis, but even now the department owns less than 5 per cent. of its working parts. The mails are carried by privately owned railroads, distributed largely from privately owned postoffices, while rural delivery is conducted by privately owned conveyances. There is no vast investment of a billion dollars or more in operative machinery, no army of experts to maintain, and no depreciation running into the millions of dollars annually.

Then again, before we take this leap into the dark, let us give a thought to where we are going to land. What is to be the policy of the government in the 4,600 cities and villages where there are two telephone systems? Will it take over both systems? If not, then which system? What will become of the other system? Will the government crush it with its superior power? What is to become of the thousands of manufacturers of telephones and accessories? Are they to be driven out of business?

Let me submit a thought that has often been brought home to me during my 17 years' experience in this line. Out of over 22,000 Independent telephone companies and associations, over 15,000 are organized for *service* rather than *profit*. People who cannot afford to pay for "red tape" and the cost of corporate management, can afford their own, local service, at a cost of from $3 to $6 a year, and are perfectly satisfied.

There are thousands of places where farmers have furnished right-of-way, set the poles and helped in the stringing of wire in order that they may enjoy this modern convenience. Over two million telephones are thus operated at the present time, that can never conform to private or public monopoly methods. They do not require the standardized service of commerce, and they cannot and will not pay for it. Why disturb this condition until there shall appear a just cause for its elimination?

On the other hand, if we leave the so-called "farmer lines" and "village systems" out of this proposed nationalization, we will have created a centaur of mammoth size and ungainly proportions, which the cartoonist of the future will depict with all the distortions of an abnormal imagination.

Telephone Development in the United States.

This country has had its experience in telephone development under monopoly, and under competition. During 17 years of patent monopoly, less than 300,000 telephones were installed; while the following 17 years of competition saw the number increase to nearly nine million telephones operated by over 22,000 organizations, composed of over 500,000 shareholders and representing an investment of $1,400,000,000. Under the stimulus of competition, we have seen this "nerve system" of commerce spread to the farm and factory, the home, the school, the church, yes, even to our mines and forests.

Wherever monopoly has been forced to relinquish its strangle hold upon a community, competition has entered; service has been improved; prices reduced; systems modernized; and the people treated with civility. Talk about the telephone being a "natural monopoly," why there is not an industry in the world that responds so readily to the vigilance born of competition. Open New York to competition, and in five years you will have 2,000,000 telephones at one-third the cost of your service today.

There is no reason why this modern convenience should not find its way into every home. It is almost as necessary as water, and cheaper than 80-cent gas. I predict that within five years you will see the telephone in practically every home in New York City, at a cost of one cent a message. Banish this thought of governmental monopoly, and you will see the stalwart form of competition sending the thought currents of civilization into the remotest corners of our world-wide possessions.

This vigorous youth of practically 17 years of unrestricted growth does not need governmental support, nor governmental domination. It is one of those "infant industries" that does not require the fostering care of protection. It is 7 times larger than its brother in the German Empire; 12 times larger than Great Britain; 34 times that of France; 38 times greater

than Russia; 60 times the number in Austria; and 84 times greater than all the telephones in the government owned system of Denmark. Within the confines of our own country, it operates more than 20,000,000 miles of wire, gives employment to a quarter of a million people and handles more than 18,000,000,000 messages a year.

Civic Purity and Public Morals.

On the question of civic purity and public morals, the advocates of governmental ownership point to the perversion of public franchises and the iniquity of private financing, forgetting that human proclivities are very much the same in public as in private life. I never knew of but one statesman who claimed to have a monopoly of public morals, and even he did not possess the universal confidence of his countrymen. Unfortunately, we are forced to acknowledge the betrayal of public confidence in isolated instances, but rejoice that we have been able to fortify ourselves against their repetition, by making detection almost certain.

Regretable as these conditions may have been they have been far less fatal to our liberties, distinctly preferable to open fraud in high places, and carry with them no stigma of national disgrace. Let us remove the temptation to future irregularities, usurpations and dishonor, by divorcing politics from business, that we may return to the legitimate functions of government. The danger of private ownership of large utilities corrupting politics, is far less than politics corrupting large utilities under governmental ownership.

I have been able to give you but a glimpse of the dangers I see lurking behind this new departure into the unexplored realms of paternalism, yet I fear I have over-talked my welcome. It is a great question, but there is a greater question to be settled than the one before us; a question to which this may be considered the opening wedge. Since the foundation of our republic, we have had a government of laws. The very cornerstone of our national structure is "equal rights to all and special privilege to none." For a time we drifted from our moorings, and our industries became the prey of unwarranted concentration; but the pendulum is swinging back to first principles, and we welcome "The New Freedom." As the shackles were stripped from the hands of four million people by the Great Emancipator, the Modern Emancipator has shown us how to regain our industrial freedom, by a return to the American principle of equal opportunities.

I can imagine a governmental monopoly under a monarchal regime, but I cannot comprehend the sequel of a political commercialism. We are called upon to support an impartial government of laws, and not a system of legalized monopoly, crushing out the very incentive to progress! For more than a century we have been taught that the function of government was to govern; that it should not engage in business against its own children, or destroy the opportunity to individual achievement. Change this policy to the fostering care of paternalism, and in one generation you will have created an army of dependants, lugging at the udder of the government, in which the spirit of self-reliance shall have become extinct. When you have robbed American manhood of the opportunity for personal gain, when you have closed the door to individual effort, when you have removed the incentive to higher attainment, you have destroyed the most vital force in our national progress.

The very theory of paternalism is repugnant to popular government, and will, if persisted in, poison the very source of our prosperity. Nationalize our industries, and make it possible for an ambitious national executive to control the added millions of governmental employes, and the political disgrace of 1912 will have been forgotten in the more startling usurpations to follow, until the prophecy of the old world that a republic cannot survive, shall have found its fulfillment to our everlasting shame.

Senate Receives Burleson Ownership Report.

Purchase by the government of the telephone systems of the country, except the "farmer" lines and the establishment of a federal monopoly over all telephone, telegraph and radio communication, were recommended in a report submitted to the senate on January 31 by Postmaster General Burleson. It was offered in compliance with a resolution of Senator Norris requesting information from the postoffice department.

The report was made on the findings of a departmental committee, which made a study of the telephone and telegraph systems of the United States and of these utilities as handled in other countries. The report makes these recommendations:

That congress declare a government monopoly over all telephone, telegraph and radio communication and other means for the transmission of intelligence as may hereafter be developed.

That congress acquire by purchase at appraised value the commercial telephone network, except the "farmer" lines.

That congress authorize the postmaster general to issue in his discretion and under such regulations as he may prescribe, revocable licenses for the operation by private individuals, associations, companies and corporations of the telegraph service and such parts of the telephone service as may not be acquired by the government.

The United States alone of the leading nations has let to private enterprise the ownership and operation of telegraph and telephone facilities, said the report. It declares all economists who have treated the telegraph subject are agreed to the monopolistic tendencies of this business and believe it should be controlled by the government. No insurmountable obstacles are found by the committee in the way of merging the telegraph and telephone facilities with the postal service.

"The postal service maintains about 64,000 offices and stations and employs about 290,000 persons," said the report. "The telephone service maintains about 50,000 offices and employs about 200,000 persons. Were these two services merged and operated under government control it would be feasible to transfer a large number of telephone offices to postoffice buildings and thus greatly reduce the aggregate expense for quarters."

The committee does not believe that any serious difficulty would be encountered in financing the proposition, "as the extinction of the securities of the superseding companies by the government acquisition would be likely to create a demand for an equal amount of other securities and it would be but natural that a large amount of the bonds issued from time to time by the government would be purchased by the former holders of the telephone securities.

In support of its recommendation that it would be more advisable to acquire the telephone network than the telegraph systems of the country, the committee estimated that it would cost $75,000,000 to superimpose the telephone on the telegraph system. Add this to the estimated value of the land telegraph lines ($150,000,000), and the cost would be $225,000,000, or $25,000,000 in excess of the estimated value of the interurban and long distance telephone network.

The report adds that the expense of equipping the latter system for telegraphy should involve only the cost of the instruments, which would be negligible.

To Sell Assets of Clarksville Telephone Co.

At a meeting of the creditors of the Clarksville Telephone Co. of Albany, N. Y., in the office of Edwin A. King, referee in bankruptcy, J. Harris Loucks, of Albany, the president, was elected receiver. Referee King instructed the receiver to sell the assets of the company at private auction, if such arrangement can be carried out. If not, a public auction may be ordered later. The Clarksville Telephone Co. operates in a number of towns in the western part of Albany county.

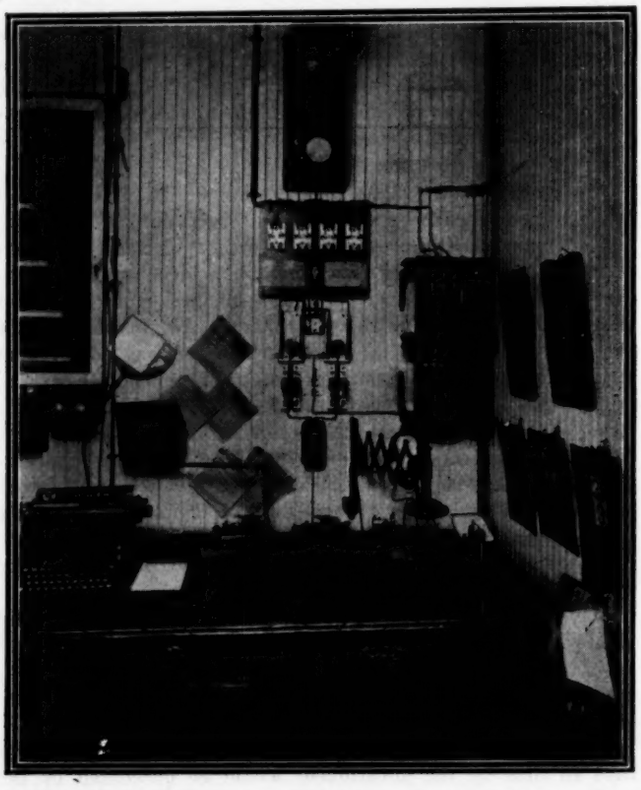
Telephone Train Dispatching on Oregon Electric Railway

An Interesting Example of Telephone Operation—The Oregon Electric Railway being One of the Few Electric Roads Using Selectors and Having the Greatest Exposure to a 60,000 Volt Transmission Line—Concluding Installment

By Wm. D. Cleveland

The ringing battery is located at one of the passenger stations, about a mile south of terminal station. It is in the first station where the underground and aerial lines come together. The voltage required on one of the telephone circuits to operate the selector is 245 volts, and the other operates on 122 volts.

The company leases all its wires from one of the commercial companies in Portland, and the latter would not allow this voltage to be used in its cable as it is only No. 22 B & S gage, paper covered. Part of a No. 37 A repeating coil is used for the local side of the selector relay, the telephone circuit being carried through the coil. Through this arrangement only a 12-volt current is used. The telegraph wires are taken care of by an extra pair from this station to the dispatcher's office.



Layout of Telephone and Telegraph Apparatus at Way Station.

The selector apparatus is mounted in cabinets furnished by the manufacturers and is well designed. The battery consists of only one bank, the sub-division circuit being taken off at the desired voltage. Dry cells are used, there being no commercial direct current voltage obtainable in this section of the city. The writer is very much in debt to an illustrated article, published in TELEPHONY over a year ago, describing a cabinet for holding dry cells, every connection being in sight and accessible for testing each individual cell; and if a defective one were found, it could be very easily replaced without having to pull out a drawer, or feeling for a connection back of some shelf. The slight incline given each cell does not impair its efficiency in the least.

All equipment, batteries, and testing cabinets with apparatus, are placed in a room which is kept locked. A telegraph key is installed on each circuit with the circuit closer taken off. If, for any reason, a test is to be made on either line, the calling can be done with a telegraph key. If, by chance, the cable should fail, the dispatcher can immediately move to this station and make the combinations with the key. This may necessitate keeping a lineman to make the combinations until he was able to handle it himself.

The location at this depot for the battery is ideal, for the temperature, where the dry cells are located, does not vary 15 degrees during the year. Many failures in installation of dry cells have been caused by companies placing their batteries in attics or cellars.

As a further improvement of the system, more than 60 iron pole jacks have been installed, in addition to 15 wall telephones being placed in freight houses, to be used when a station is closed.

Pole jacks are installed at sidings and spurs which are located over two miles or more away from an agency station. They are made of very heavy iron, so as to repel the shots of the small boy, out on his hunting expeditions, who decides to try his aim on the box; also of hunters who are larger than the boy. It is securely locked, contains fuses and protectors, and is on the line only when the plug is in. There is a metal trap that drops over the plug hole when the plug is withdrawn. Anyone pushing a stick into this hole will not damage the line to any extent. The contacts in these jacks are built so that if a piece of iron were used, it would have to have a peculiar shape on the end to do any damage. Up to this time there has been no trouble of this kind. The wire used to connect the line is No. 14 B & S twisted pair and knobbed every four feet.

Two, universal type, copper connectors are used to attach each wire to the line. This method was used, for if a lineman has any doubt of there being trouble in this wire, it can be easily disconnected. He can drop one of the test connectors to the ground and still have another to fasten the wire. Thus it is unnecessary for him to wrap the jack around line wire, and wait until some future time to solder the connection.

On the ground at the base of the pole, a stool, 3 ft. x 2 ft., insulated with porcelain insulators, is placed for anyone using the pole jack to stand on. It is securely wired to the pole, and a band painted white two feet wide and a foot above the pole jack, is painted on the pole, so that the stools may be easily located, both by day and by night.

The new system provides communication not only during hours of duty, but during every hour of the day and night. By arrangement with one of the commercial telephone companies at the dispatcher's headquarters, outside lines can be linked with the railroad line, giving the trainmaster, superintendent, or any other official, instant communication, if anything happens that requires his attention or advice.

All freight trains are equipped with a wall magneto telephone securely bolted to the cupola, and the receiver cap tapped to prevent it from coming off. There is also connected a 50-foot reinforced stranded wire portable twin conductor with double braid. The breakdown test on this wire is 7,000 volts. A plug is attached to the wire, having a fibre handle about six inches long. There is also a line pole, placed in the caboose, to be used when a pole jack is not convenient.

All passenger trains have a baggage car in addition to

coaches, and a portable telephone pole is placed in them. Passenger conductors are provided with a portable telephone in a leather case, which also contains a plug and six feet of wire. This set has shoulder straps and weighs only seven pounds. Each conductor is responsible for his set and the brakeman usually places it in the train box. The sets are tested on every run out of a terminal by the conductor. If not O. K., he turns it in to the trainmaster's office and receives another one.

Each station is provided with a patching and testing panel. The operators are taught which way to open a line and to locate any minor trouble. Each telephone has a switch for disconnecting the station telephone from the line. Protection is provided by fuses of three amperes capacity, copper blocks with mica between them, and a double tube, metal vacuum lightning arrester. This has an air gap of 3/64 of an inch, which has an equivalent spark potential of .005 inches in air. The arrester will discharge at a potential between 350 and 600 volts, the low breakdown point insuring sufficient protection.

This is the first line of its kind to have them installed and so far they have proven a success. If for any reason the copper blocks on the protectors, which were placed ahead of the vacuum arresters, should become grounded, there is provided a single pole, single throw, 15-ampere, 125-volt switch, so that an operator, finding the lines noisy, immediately pulls his ground switch. If this clears the trouble, he notifies the dispatcher, but if it does not, he pulls out his south switch on the test board. If this should happen to clear the line, he notifies the dispatcher.

The simplex circuits are working as successfully as can be expected, on a line of this kind. At Forest Grove, the end of a line, the telegraph simplex is taken off and connected to a No. 10 B. W. G. iron wire, 62 miles long, having 17 150-ohm relays. In addition to the battery furnished in Portland, a bank of gravity cells is maintained in Salem, the terminal of the local Morse wire.

At way stations a foot switch is used where there is an operator. This allows the operator to listen on the line for information about trains. It closes his local battery and also connects the secondary of his induction coil. The foot switch is placed where it is most convenient for the operator, and is screwed to the floor or table leg. The wire running to it is enclosed in a ¾-inch pipe and securely fastened to the table leg or under the table. This is done so that if the operator has a desire to place his feet up under the table or desk, he will not break the wires, or cause dirt from his shoes to fall down into the contact point of switch. There is only one objection to a foot switch and that is when a station floor is scrubbed. Water has often been thrown in the direction of the switch; and the splashed water, running down the pipe going in at the opening under the foot lever, short circuits the contacts.

The transmitter arm is of the ferry gate type. The design is such that it may be used with any desk telephone by means of a clamp device.

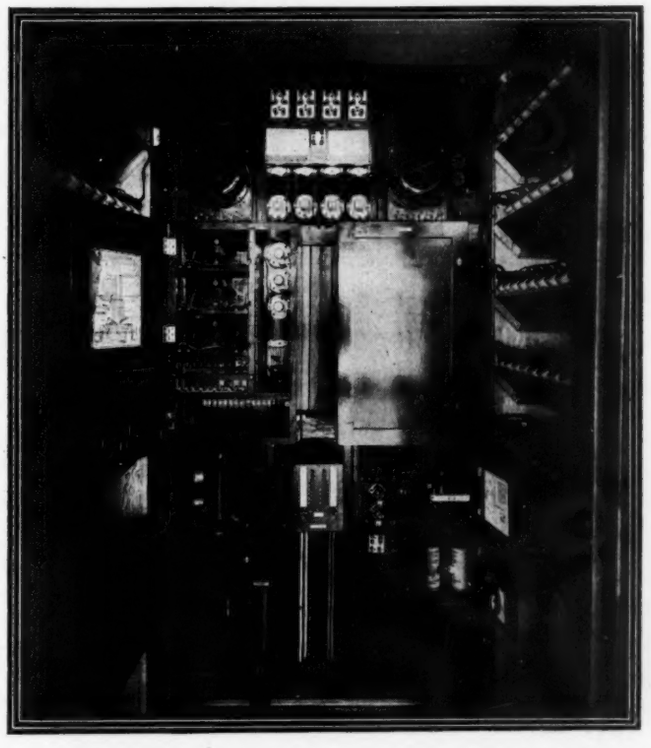
No generator is provided at the selector station, as the dispatcher is on the line day and night.

At several points on the system where there is no night operator, a circuit and stick relay, devised in the telegraph department of the road, is used. The selector is not cut off the line at a station at night where one of these relays is installed. The operator puts in a double pole, single throw switch connecting his bell circuit to where relay is mounted. When the dispatcher rings the station selector, the local battery bell circuit energizes a coil which picks up the armature, having a sliding carbon contact. This closes the circuit by energizing its own coil and lighting a 40-watt lamp, 110-volts in multiple, one of the lamps being in series with the coil. The lamps are mounted on a pole so that they can be seen both ways.

In order that the dispatcher may know this is working the first time he gets the answer back from the selector local battery bell. After receiving this, he immediately turns his key for this station; if he fails to get an answer back, the circuit is O. K. Two lamps are used, for if one lamp should burn out, the other lamp will burn. Any crew seeing this red light stops and calls up the dispatcher. He has to unlock a small iron box with his switch key, and press a button which restores the relay back to normal, and at the same time cuts out the light.

Several experiments have been made with loud speaking receivers, to relieve the dispatcher of wearing the head receiver, as it is very tiresome for eight consecutive hours. Another and more important reason is to keep away from the snapping and crakling noises, caused by the charging of the 60,000-volt electrolytic lightning arresters in the substations. These disturbances in the air affect the telephone and telegraph lines for miles around. If one side of the telephone becomes grounded, it throws the entire line out of balance and the receiver has to be taken off, held by the hand near the ear and used only when actually necessary. If the 60,000-volt line switches should be opened while the dispatcher has on his head telephone set, a very disagreeable noise is produced. Up to the present time we have not had very good success with loud speaking receivers. No doubt there will be quite a demand for them if manufacturers can produce one that can be used successfully on a long line.

The line is given over for message work between Salem and Eugene when not in use by the dispatchers, as there is no local Morse circuit, all messages being relayed from West Woodburn by telegraph to Portland from this district. Many



View in Room Where Telephone Apparatus Is Located.

telegrapher operators condemned the telephone while it was being installed, but now the commercial telegraph company often calls for an hour trying to raise an operator, and often has to get the dispatcher to ring him, when he responds immediately. Nearly 75 per cent. of the telegraph operators on this road at the present time prefer to use the telephone to the telegraph wire. It is safe to say that the dispatcher using the telephone can call, send and complete an order before

another dispatcher using a Morse wire can get his operators lined up for a train order.

This electric railroad is operated with the same rules and orders as adopted by steam railroads, the only difference being that electricity is used to move its trains instead of steam.

There is more misunderstanding between trainmen and dispatchers where the telegraph is used, as the common saying with the operator is put in the form of a message. Then he may send it, and he may not. The telephone brings the trainmen closer to the dispatcher, for many times when the trainmen can explain to the dispatcher quicker than the third person, the dispatcher has them come to the telephone. The results of harmony of forces cannot be over estimated.

The installation of apparatus was made by a crew of three men using gasoline motor cars in addition to the trains.

There is a complete and efficient organization in the telephone and telegraph department in which is also included the signal department. Two linemen are used to maintain the two divisions of telephone and telegraph lines, the work of the inspector and the linemen being combined. These men have had many years experience both on telegraph and telephone line work, in addition to exchange work, and are trained so that the responsibility rests on them and not on some one watching them.

They are encouraged in their work, and if any suggestions they make are feasible to try out, they are provided with the necessary material and apparatus that is available. They are made to feel that operation of the road is dependent upon them.

Each lineman is provided with a four-wheel gasoline motor car, front wheel drive, which is used for emergency work. These cars are equipped with a loud ringing bell, 10-inch movable searchlight, with Prest-o-lite tanks, lanterns, flags and rail scrapers, so that if trouble at night arises, it can be cleared. During the last winter, several shorts on the line were cleared this way. If the lineman is out after sunset, he can run with safety to his headquarters. These cars are not run on train orders, although they weigh 400 pounds, equipped, without the lineman. They can be taken off by one man at wagon road crossings. The dispatcher always keeps the lineman informed if there are any extras on the road, and when they will be in his district.

One man is stationed 70 miles from dispatcher and covers a 100-mile division, including several small branches. He also has charge of crossing bells in his district. The other lineman, stationed in Portland, covers the remainder of road and, in addition, 30 miles on a subsidiary line. He also has to take care of three selector ringing batteries located in different parts of the city. He has no crossing bells, as this is taken care of by the block signal maintainer. In addition to this, the company does all its own repair work, such as winding coils and other minor repairs.

These men have been trained to locate any trouble on line or instruments, to clear any trouble on the telephone, or selector, and they do it without placing the telephone out of service.

On a telephone system of this kind, eternal vigilance is the price of good service. The insulation has a tendency to become bad and upset a balance. The lines must be absolutely free from grounds, particularly slight tree grounds, which in wet weather produce a noisy line. A telephone line, not near a transmission line, such as used on the steam railroads of today, does not require such close attention.

The telephone dispatching circuits were placed in service about the last of April, 1913. Much credit is due to A. J. Davidson, general superintendent of the road, for his suggestions in regard to the selection of the apparatus and his assistance while it was being installed, for he took a keep interest in it, being a veteran telegraph operator.

The line south of Salem was working, as were two temporary local telegraph circuits, and they had to be cut over to be used as a telephone line one afternoon. The general superintendent provided a train instead of the gasoline motor car and accompanied the crew. He was always the first to talk to the dispatcher when a station was cut over. The end of the line was reached at 8 p. m. without a hitch, there being 35 stations on the 125 miles and 12 on the other circuit of 25 miles. Part of the latter division is double tracked and is covered by continuous track, semaphore block signals, so very little dispatching has to be done on it.

Some Letters

A Bell Factory Method—Why Not Stop a Nuisance, Etc.

By J. C. Kelsey

I received a letter this week which particularly interested me, and I believe not only the letter will interest you, but that the letter accompanying it, will have vital interest.

I have had a great deal to say about the "dog-in-the-manger" manufacturing policy of the Bell interests. I have shown you telegrams sent by bankers in their interest, and have related, from time to time, the various methods employed by them to force the use of divine apparatus upon an unappreciative public.

J. C. Kelsey, Telephony Publishing Co., Chicago, Ill., Dear Sir:

What portion of the Bell factory sales do you suppose was like this?

They seem to have taken TELEPHONY's Directory and shipped two telephones to every company of any size.

This man had sold out a mutual telephone company some years ago.

The telephones came addressed to the telephone company. Some one got them, and now the Western Electric Co. (Bell factory) is threatening to sue the old owner, an innocent bystander—much luck they will have.

Now for the salient facts. Western Electric shipped some strangers some telephones.

They cast their bread on the waters and it did not return. With true missionary zeal, this zealous concern, so vitally interested in saving the souls of the benighted Independent telephone operator—shipped every one they could learn about, a pair of telephones.

How well we remember the classical confession of President Sunny of the Chicago Telephone Co. How bitterly he complained of the cost of maintaining Bell telephones, and he produced figures showing that 30 per cent. of them are returned for repairs each year.

Right in face of this, this philanthropic concern ships telephones to imaginary companies, and expects imaginary people to pay for them.

Do not be surprised, as you may yet get a bill from Podunk for two telephones shipped to that station some years ago.

How bitterly it must strike into the souls of these divine apparatus makers to see how unappreciative the common herd is. How unenlightened they must seem to the monopoly man, who is trying to make them happy by selling them Bell telephones.

It seems that a letter was written by the Bell factory on December 8. Anyway it was not answered, for here you get the red-hot epistle straight from the heart of the Bell factory man.

What a pity he must feel for the poor misguided people who did not forward that $19.70.

WESTERN ELECTRIC COMPANY,
611-613 Wyandotte Street,
Kansas City.

Dec. 29, 1913.
In reply refer to BGG-EG
Replying to

Pilot Grove, Ind. Tel. Co.,
P. R. Lottyseich, Mgr.,
Pilot Grove, Mo.

Dear Sir:

You have not replied to our letter of December 8th regarding the old balance of $19.70 on your account covering two telephones that were forwarded to you on trial more than seven months ago and we cannot understand why you have apparently taken no action toward adjusting the transaction.

By accepting these sets from the railroad company, you assumed the responsibility of either paying for them or returning them to us at our expense, and this is all we ask of you.

If you were unable to use the telephones on your lines, we want you to return them to us at once in the same condition in which they were received, so that we can credit your account accordingly. If they were installed and are in use in your system, we must insist that you send us your check in settlement.

We cannot permit the matter to continue in its present condition any longer and will expect it to be fully adjusted by January 5th. If we have not heard from you by that date we must conclude that it is not your intention to treat us properly and shall consider the account an appropriate one for reference to the Electrical Credit Association for the information of its members who may also be interested.

Your non-compliance with our request will leave us no recourse except to hand the matter to our attorneys with instructions to proceed, as they think best, to secure the money that is justly due us.

We do not wish to take any action of this nature without first giving you an opportunity to adjust the transaction voluntarily, so to insure this letter reaching you, we are sending it by registered mail.

Trusting that you will give the matter your immediate attention, we are,

Yours truly,
(Signed) B. G. CLARK,
For Assistant Treasurer.

Now let us look at some of the injustice of this deal.

It would not have been perpetrated by an Independent telephone manufacturer—he knows better. They forwarded some telephones to a station, addressed to a company which no longer existed.

No one was authorized to receive these telephones, and the chances are that some disgusted agent gave them to some one in order to get rid of them. Now get the idea of the third paragraph:

"If you were unable to use these telephones, we want you to return them in the same condition you received them."

That is hardly fair. Some one might send your neighbor a refrigerator, and a careless man might damage it.

Even your neighbor could hardly be blamed, much less yourself. And then to be threatened by the Refrigerating Credit Association because your neighbor, or some one, took or accepted the refrigerator unknown to you, is really too much.

But it seems that the letter of December 29th fell upon deaf ears, for on January 15th the following gentle epistle was handed out. Surely some one is doing an ungenerous act.

The town of Pilot Grove should take up a collection of $19.70 and forward it, rather than be exposed to the cruel darts of the Electrical Credit Association. It has always seemed to me that this threat is zero in the scale of appeals to reluctant payers.

WESTERN ELECTRIC COMPANY,
611-613 Wyandotte St.,
Kansas City.

January 15, 1914.
In reply refer to BGC-EG
Replying to

Pilot Grove, Ind. Tel. Co.,
P. R. Lottyseich, Mgr.,
Pilot Grove, Mo.

Dear Sir:

Receiving no response to our letter of December 29th as well as the ones which preceded it, it seems that there is no other course open to us, except to adopt the measures outlined in that letter, and we are today referring the matter to the Electrical Credit Association of Chicago.

The invoice in question amounts to $19.70 and as it was rendered on July 31st, your continued silence regarding it compels us to believe that it is not your intention to treat us properly.

You have had ample time and every opportunity to either pay for these telephones, or return them to us, and your failure to do so, compels us to protect ourselves in the best possible way.

We trust, however, that you will let us have a remittance promptly, so that we will not be obliged to resort to legal action in order to secure the settlement that is justly due us.

Yours truly,
(Signed) B. G. CLARK,
For Assistant Treasurer.

Just what the next letter will be, I must leave to your imagination. Throughout all the letters, the predominating idea is an appeal to get a remittance from some one.

It was the old maid who answered the hoot of the owl by saying "Oh, Lord, anybody."

It reminds me also of the Chicago bank who got tangled up by a boy financier to the extent of $30,000.

The bank found out that the boy had a rich grandmother in Milwaukee. So they rushed up to that burg and told grandma that they would put the boy in jail, if she did not pay the $30,000 at once.

The poor old lady, frightened to death, produced the $30,000. And when the lawyer told her that no one had any legal right to extort money from her, she went into court, and got her $30,000 back.

Now here is a manufacturer who blindly shipped two telephones to a defunct telephone company. Because they could not find the person who took the telephones, they are threatening an innocent bystander with the Electrical Credit Association, just as the Chicago bank did the Milwaukee grandmother.

They will find, without the aid of the Credit Association, that a man who sold the company four years ago cannot be held responsible, and the Electrical Credit Association had better act with caution.

No one can be subjected to such ignominy without recourse.

I have handled this subject, not only to call attention to the inefficiency of monopoly, but to the point which should interest Independent telephone men: The inability to reach anyone in a huge organization; the lack of personality; the hopelessness of reaching anyone with power to act.

The rankest injustice can go on for months, while the report of it is slowly wending its way through the maze of red tape, which is so necessary in an overgrown institution.

Since the discussion of the Bell factory idea, I have a letter from a man who boldly says he is giving the Bell factory his transmitter business because they are cheaper than anyone else.

A Bell transmitter can be bought for $1.05—or less, yet the Bell company charges its licensee companies 4½ per cent. of their gross earnings on account of the use of transmitter, receiver and coil.

The average gross income of the Bell licensee is around $36 a station year. Do you wonder why every state corporation commission has objected to the 4½ per cent. plan?

To charge a licensee $1.62 per year for a transmitter costing $1.05 and a receiver about 90 cents, is a little too much for their sense of humor.

The blow has already been struck. In the Central Union (Bell) case, the receivers of the company are to terminate the 4½ per cent. rental payments, and in lieu thereof doubtless proceed to purchase, on best terms possible, transmitters and receivers from either Bell or Independent manufacturers.

Don't you realize that this 4½ per cent. clause is the weakest thing in the industrial world?

Just think of charging anyone 83½ per cent. interest! That is exactly what it means to pay $1.62 annual rental on a Bell transmitter and receiver.

All through this line of endeavor, there are so many unreasonable things.

The Bell will sell you a transmitter and receiver for $1.95, but they will rent to a licensee and charge him $1.62 per year—where they have a cinch, and rent to Chicago for 50 cents because that was all the city officials would pay.

It gets back to the fatal word, discrimination. The Bell company, in selling you transmitters and receivers, discriminates against its own companies, or at least that part of it held by minority stockholders.

So I am calling the attention of the Independent telephone buyer to the ridiculous side of the situation.

It is true that he can buy Bell factory goods at lower prices; at prices lower than Independent manufacturers, because the Independent manufacturer has no kindly angel, willing to aid and abet him in the rank crime of discrimination.

This condition is not permanent. No condition of discrimination can survive the allotted three score and ten. It dies even before it gets of age.

Discrimination is a deadly evil and its poisonous gases reach into every nook and cranny.

Our very nature revolts at any restriction of liberty. We want people to get justice. We all rush in and stop a fight, especially where a big man is pounding a boy.

In our childhood, we hated most thoroughly the boy who fought under his big brother's protection. We wanted an even break, and that is the very reason I write upon this great bully condition today.

The condition at Pilot Grove has many aspects of the bully. Not only does it resemble the bully in general behavior, but it resembles the order of intelligence of a bully.

As I look back upon the bullies of my youth, I learn that the boys were bullies because of a low order of intelligence. And another peculiar thing: These pugnacious and scrappy bullies never seemed to grow up. They stand today in the bantam weight of business classification.

A corporation, however big, does not live for the present. It has a future, and the bigger it is, the bigger the necessity of a future is.

By resorting to bully attacks and discrimination, it dwarfs and stunts its future employes and managers. They never grow up, and as the bully, degenerate into the bantam class, unable to endure the speed of the future, which demands that all men and corporations shall be free and equal, thus to pursue happiness with some chance of catching it.

I do not mean to give the impression that the Bell factory is doing wrong in collecting a just bill.

The laborer is worthy of his hire—no one can dispute that. But I object to the implied threat to hound a man with a blacklist—without close analysis.

It is like hanging a man before the reprieve comes and telling the sheriff a mistake has been made.

I cannot understand why the sale of a Bell telephone causes so much rejoicing at 15 Dey St.

I can only fathom it on one ground: The New England investor believes Bell telephones are wonderful.

Who knows that some Paul Revere does not ride madly through New England with your order in his hand, spreading the glad tidings that your soul is saved, and their reputation sustained.

I find it hard to understand why a great licensee company with $50,000,000 of assets, will sidetrack every semblance of work to help the Bell factory sell a $2,500 switchboard.

It is hard to understand these things, but who can fathom the turgid depth of big business. A big business invariably seems to strain at gnats and yet swallows camels easily.

And that promise of getting a better price for your telephone system because of Bell factory equipment; right in the face of the promise to the government to buy no more competing plants. The Bell rarely buys a non-competitive plant except at its own price.

Inconsistencies are many—they forbid analysis—and so rank that even the most credulous should see.

And the banking suggestion or threat: Think of a great New York bank stopping to send a telegram to a man in a country bank actually telling him what to do, and he, the big man of his community. If this isn't a form of bully tactics, unworthy of the sender of the telegram and the recipient of it, what is?

Then to send sample telephones to unknown companies, and, at random, select a likely man to threaten and blacklist.

Frankly, it all savors of hopeless inefficiency, of helplessness, and of peril to its future solvency.

It may be that the government will overlook the Bell-Western Electric conbination. How it can do such a thing, after disassociating the Bell and Western Union, is hard to conceive.

There is some economic excuse for the alliance of the Bell and Western Union, and for my part, I can see no comparison in this to the evil of the Bell factory combination.

The Bell influence in Western Union did help us. It gave us valuable concessions—the night letter, day letter, etc.

But to maintain a licensee monopoly and try to split

the competitive field is absolutely uneconomic and senseless, and positively un-American.

As the time goes by, I see no tendency to complete the daisy chain of dissolution of trusts. To countenance one and frown upon another, is discrimination itself and a violation of the Sherman Act.

The government can give great aid, but the greatest aid can come from within.

Give the manufacturer of Independent telephone apparatus an even break and he will win out, and he can even hold his own with odds against him, providing they are not too great.

Just do your best, not only to be fair to him, but to yourself, the greatest beneficiary of your actions.

MORAL: Don't get caught in a maze of red tape.

Program of Illinois Independent Convention.

Growing interest is being aroused in the annual convention of the Illinois Independent Telephone Association which as stated in last week's issue of TELEPHONY, will be held at Leland Hotel, Springfield, on February 17, 18 and 19. In addition to the full day's work laid out for the first day, as already reported, including the school for operators, address on the Service Association and the wire chief's conference, Secretary B. F. Baker, of Le Roy, Ill., has announced the details of the Wednesday and Thursday meetings of the convention. The meeting on Wednesday forenoon will open with an address of welcome by Mayor John S. Schnepp, of Springfield, followed by a response by President James W. Barrett, of Pekin, Ill. This will be followed by the address by Ex-Governor Richard Yates, of the new Illinois Public Utilities Commission. The report of the secretary and the report of the credential committee will conclude the morning session.

At the afternoon meeting Hon. O. F. Berry, of Carthage, Ill., will address the convention on the public utility commission law and its application to operating telephone companies, and Attorney Ben B. Boynton, of Springfield, will lead a general discussion of the public utility law. Ed D. Glandon, secretary of the Independent Toll Clearing Co., will then give a talk on the clearing house.

Addresses by Governor Dunne and by members of the Public Utilities Commission will be given at the banquet on Wednesday evening.

At the Thursday morning session, Manford Savage, of Champaign, Ill., will discuss "Our Future Under Regulations," and J. C. Kelsey, of Chicago, will talk on "Independent Telephone Finance Past and Future." Miss T. Anne Barnes will read a paper on the "Relations of Managers to Operators."

The afternoon session will be devoted to talks on the "Benefits of Co-operation and Organization," by W. S. Vivian and "What the Action of the A. T. & T. Co. Means to Telephony," by L. A. Herrick, of Freeport, Ill. The session will conclude with the reports of committees and the election of officers. Quite a large number of manufacturers and jobbers have signified their intention of making exhibits at the convention.

In a notice sent out to telephone companies in Illinois, Secretary Baker says:

"Regardless of all that has been accomplished, many problems are still before us, and a better solution can be obtained by organized, rather than by individual, efforts. The utility commission law will require a large amount of detail work in complying with the requirements, and it is the intention of our association to employ an attorney, located at Springfield, to represent all the members of our association, at any time an attorney's advice or counsel is needed, before the commission; who will be available at all times either to represent us as an association or as individual members, or to answer any questions pertaining to our business. This will not only be a satisfactory, but an economical way to handle the multitude of conditions that will necessarily bring our companies before the commission.

"We are also endeavoring to make a satisfactory arrangement with the commission regarding the filing of your rates. In case of rates not filed by February first, we have the assurance of the commission that there will be no penalty attached, and that this matter can be deferred until after our state meeting, February 17, 18 and 19."

Salaries of A. T. & T. Co. Officials.

There has been in the past more or less conjecture as to the salaries paid to the principal officers of the American Telephone & Telegraph Co. and the facts have now been set forth by that company in a statement required by the Public Service Commission of Massachusetts. The statement includes a list of 38 officers and employes receiving an annual compensation exceeding $6,000. Of these 21 received $10,000 or more, and eight received $20,000 or more for the year ending June 30 last. The list follows:

Theodore N. Vail, president	$100,000
Edward J. Hall, vice-president	37,500
N. T. Guernsey, associate counsel	33,333
N. C. Kingsbury, vice-president	30,000
G. V. Leverett, general counsel	24,583
J. J. Carty, chief engineer	22,000
C. G. Du Bois, controller	22,000
A. S. Hibbard, relations with telephone companies	20,000
W. R. Driver, treasurer	19,583
G. D. Milne, assistant treasurer	15,000
U. N. Bethell, senior vice-president	15,000
Charles H. Wilson, general superintendent	15,000
C. D. M. Cole, general attorney	13,500
T. D. Lockwood, patent counsel, Boston	12,000
F. A. Pickernell, engineer	12,000
H. B. Thayer, vice-president	12,500
B. Gherardi, engineer of plant	11,000
K. W. Waterson, engineer of traffic	11,000
M. Egleston, counsel	10,000
R. W. Devonshire, assistant treasurer	10,000
C. S. Gleed, executive department, Kansas City	10,000
F. A. Stevenson, general superintendent of plant	9,000
C. R. Bangs, vice-president	9,000
J. A. Barrett, engineer	8,000
J. D. Ellsworth, advertising manager	8,000
M. C. Rorty, commercial engineer	8,400
H. B. Smith, assistant controller	8,000
H. S. Brooks, general commercial superintendent	8,700
F. A. Buttrick, assistant treasurer	7,500
T. B. Doolittle, executive department, Bridgeport	7,500
T. J. Perkins, assistant attorney	7,200
J. L. R. Van Meter, general superintendent of traffic	6,900
C. H. Arnolds, engineer	6,600
J. E. Caldwell, executive department, Nashville, Tenn.	6,666
W. S. Gifford, statistician	6,600
J. H. Peck, assistant to general counsel, Boston	6,600
F. L. Rhodes, engineer	6,300
H. S. Warren, engineer	6,300

Several of the officials mentioned in the foregoing list also receive salaries from the various Bell associated companies in which they are officers.

Outside Representatives Welcome at Madison Meeting.

That the conference to be held at Madison, Wis., on February 12, to discuss proposed telephone standards is attracting wide interest is evident from the fact that the state of Michigan and the city of Chicago have asked if they may send representatives. It is expected that nearly all of the larger telephone systems of Wisconsin will be represented. Chairman John H. Roemer, of the Wisconsin Railroad Commission, said representatives from other states, cities and telephone companies will be welcomed. This is the first time that any state has attempted to establish standards of telephone service, and the commission desires all possible assistance.

The Rejuvenation of the Craneville Telephone Exchange

A Serial Story Begun in the August 16 Issue, Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged and Changed Successively from a Grounded to a Local Battery, Metallic System and Later to Common Battery

By Paul Hamilton

"The Doctor has asked me what determines the cost of telephone service," Mr. Barrows began when the four men were seated at the table at their regular Monday night meeting. "It is a question that is too seldom considered by small telephone promoters and operators. They attempt to so conduct the business that there will be a money profit in the bank at the close of the year, the same as any other business or enterprise.

"To make it as plain as possible, we will consider the plant here as a manufacturing enterprise, the same as the brickyard where Mr. Dietz has been employed. At the brickyard, they turn out so many brick a day, keeping their supply above the regular demand. They do not keep the entire plant keyed up ready for operation at a moment's notice. Suppose I should go down there in the morning and ask for 100,000 brick. I would probably be told that they would not be available for several weeks.

"The reason for this is that neither material nor men are at hand to turn out such a quantity on demand. Neither has the plant been kept in working order; conveyors are rusted and out of repair; the supply of fuel is not at hand; a portion of the clay pit has been allowed to fill with water and it is estimated that it is cheaper to spend a week or more preparing to execute my order, than it would have been to have kept the plant keyed up to its maximum load.

"Nor would it be good policy for them to pile up 100,000 brick or more, with the usual demand for much smaller quantities, unless labor, fuel and other elements were very low, and there was a prospect of their increasing in cost.

"It is the same in almost any producing industry. A part of the plant can lie idle, requiring little upkeep, or expense, above the regular fixed charges necessary to conduct the business on the minimum basis. There are also opportunities to take advantage of low prices for raw material and cheap labor during dull seasons and to accumulate a stock for future demand at a minimum cost.

"Now let us consider the telephone business: Here we have a plant for the purpose of supplying patrons with an invisible commodity which we call service. Our product is peculiar, inasmuch as it is produced or manufactured on demand. Our customers do not come to us today and say they will require such and such service for use tomorrow, or next week, or next month. We cannot accumulate a stock of our product during pleasant weather, when everything is favorable for the largest output at the lowest cost. We cannot fill a warehouse with service, wrapped in various sized packages, ready for delivery upon demand. In addition to this, there are only certain small parts of our equipment which can be duplicated for use in emergencies.

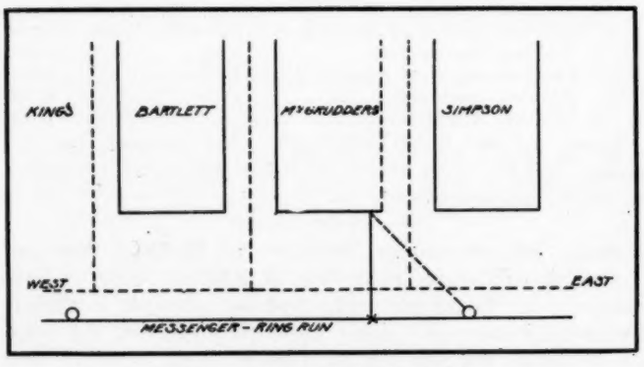


Fig. 55. The House Drop Problem.

"Our patrons, except in a few exceptional cases, cannot anticipate their requirements. They demand of us a delivery of service in either large or small quantities, as their exigencies require. One or a hundred may make simultaneous demands. Therefore every portion of our plant, which is in any degree affected by an existing contract, must be kept in working order constantly. Not only that, but the working portion of the plant must be keyed up to provide the maximum output upon a moment's notice.

"Going a step further, a certain amount must be invested in equipment and facilities for future growth. It may be from one to five years before that portion of the investment enters into the active earning capacity of the plant."

"But you can get an extra piece of switchboard anytime; I seen him done in Lexington," interrupted Germany.

"That is true, but remember the switchboard is only a unit. Means of connecting telephones to it must also be provided. In our case here, enough switchboard was provided to last in all probability, 20 years, as far as capacity goes. Now we find that after seven years, the board is inadequate and obsolete. A smaller board would have served the same purpose at considerable less cost."

"The same thing might occur in the brick business," observed the Doctor.

"It might," replied Mr. Barrows, "but is not very likely to, because the details of brick making have been what we may call standardized for many years. The telephone business is in its infancy, but is growing toward standard methods and practices rapidly."

"But the basis of cost at the brickyard, for instance, is figured upon 1,000 brick. What I was trying to get at was the cost unit, or the unit to be used in calculating telephone investments," the Doctor explained.

"If you contemplate making any such investments, there is no set rule you can follow which will assure success. There is an element which cannot be classified. It resolves itself into plain judgment, based upon experience and general knowledge of the business. However, I am willing to impart such information as I can. You will readily see, however, that it is not always possible to secure the data required to form even a tentative basis for financial investment.

"The plan I have followed here is, and should always be, in cases of small exchanges, very simple; that is devoid of great detail. For instance, when I came here and looked over the situation, it was from a general standpoint that I decided how much I cared to invest. My estimate was based more upon the possible than upon the real.

"In this case we have but two sources of income—subscribers' rentals and miscellaneous sales. The last item includes junk and obsolete equipment.

"Of course the expense side of the business is much more varied; still I cover them all under four classifications: General expense, construction, maintenance and operation.

"Now we come to the direct answer to the Doctor's question. My practice is to use each subscriber's contract, or sta-

tion, as a unit. That is the unit of the income, and therefore it can easily be used as the unit in all calculations. A little later on I will have some actual figures which I can use to demonstrate my ideas to you.

"As it is now, we are only getting things under way and our expense is away above normal. On that account I have not yet been able to arrive at a just apportionment of receipts to cover the various items of expense. My plan is to make a quarterly apportionment under these items or headings. Current expense—which will include fixed charges, such as rent, light, interest on my investment, etc.—operation, maintenance, construction, and reconstruction or replacements.

"Too many small telephone enterprises fail because no provision is made for replacing the plant when it deteriorates or becomes obsolete. The income not required for current expense is considered profit and treated as such. Therefore, when a general replacement is necessary, there are no funds at hand and a mortgage is the usual recourse.

"Now Frank, I guess we will give you a chance. I see you have something on your mind," said Mr. Barrows.

"I guess it isn't much of a problem," answered Frank, "but Billy Simpson stopped me from running a drop from a pole back of his lot, across to McGrudder's house. He says we will have to pay to go over his property. I didn't think he could stop us as long as we kept up out of his way."

"Oh yes, he can. He owns sky high within the boundaries of his property."

"It's just a dollar he's after, already," said Germany. "Why, if a nickel had a rattlesnake on it, Bill Simpson would be dead long ago. He'd pinch it so hard it would sure bite him."

"Well," commented Mr. Barrows, "we will not try to break him of the pinching habit. Let's see if we can't find a way to get around his property. What is the layout there, Frank?"

"It's like this (Fig. 55). I want to jump from the pole back of Simpson's, because it will make only a 75-foot drop. From the pole back of King's the drop would be about 120 feet, and the electric light leads come in from the west pole. I do not want to drop off the same pole with them if I can help it, unless the angle leaves us in the clear if their wires should fall. Here they would be almost over us all the way. Simpson stopped them from crossing his lot."

"I heard something about that. He is the fellow they tried to force into line by refusing to put light into his house," said Mr. Barrows.

"And they had to back up and put it in anyway," supplemented Germany.

"Yes, as long as he is responsible, they have no right to refuse," said Mr. Barrows.

"He'll let us cross the lot, if we will give him a telephone free," Frank informed Mr. Barrows.

"No. We can't start that kind of a game. Your line comes in from the west, Frank?"

"Yes sir. We have a ring-run with six lines through that alley."

"I would much rather break all drops off from knobs at the pole. But in some extreme cases, such as this one, you may pull your drop back to a point opposite McGrudder's place and break off from the ring. The ring should be a few feet back of the point where your drop will dead end at the building."

"Why is that?" asked Frank.

"I will show you," answered Mr. Barrows. "After you have laid your wires in the ring, take a single strand of bridle wire about 18 inches long for a tie. Form a loop of your line and drop wires by turning the free end back from the ring parallel to the wires in the run.

"Thread your tie wire through the drop end about four inches from the ring, like this (Fig. 56). Then give the short end of your tie four wraps around the drop toward the ring. With the long end of the tie, make six full wraps around both line and drop and then four wraps around the drop. Thread the tie through the line and take four wraps around it. Now with your drop pulling slightly ahead, the strain will come on the tie. This being insulated the same as the wire, will not cut through as quickly as if the heavy strain came on the ring."

"What do you figure the endurance of the insulated wire runs?" the Doctor inquired.

"I am not an authority, but I am making my calculations

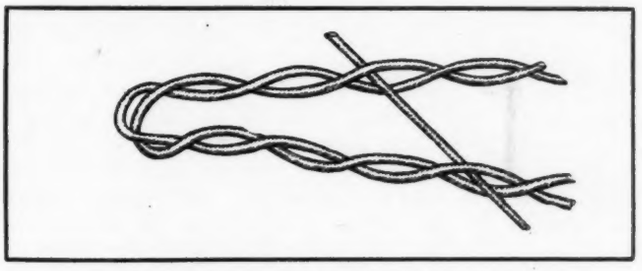


Fig. 56. Method of Tying Drop Wire at Ring.

on six years. From my observations, it will run more than that, but I wish to be on the safe side. By that time we will be in a position to substitute small cable for a greater part of them."

"Many of the folks want us to give them the old poles we take down," said Frank.

"The old poles are of no great value as telephone property here in town. I have arranged to store them, however, and wish you would handle them as carefully as possible. I think we will find use for them. Farmer lines are becoming quite common and these poles are suitable for their work. If not, they are worth a little something for fence posts," replied Mr. Barrows. *(To be continued.)*

Western Pennsylvania Association.

The fifth annual convention of the Western Pennsylvania Independent Telephone Association, held last week at Pittsburgh, Pa., was attended by about 100 representatives of Independent telephone companies in western Pennsylvania. President, J. Walter Barnes, of Fairmont, W. Va., presided. C. Phillips Hill, of Pittsburgh, delivered an address of welcome; H. E. Bradley, of Philadelphia, gave a short talk on "The New Female Labor Law;" and J. C. Core, of Uniontown, spoke on "Toll Business." An address dealing with the building of toll lines was made by T. J. Shufflin, of Butler. Reports were then made by delegates who attended the Chicago convention of the National association.

At the morning session on the following day the following officers were elected:

K. B. Schotte, of Kittanning, president; Dr. J. K. Brown, Brookville, and A. M. Crichton, Uniontown, vice-presidents; H. E. Webb, Pittsburgh, re-elected secretary-treasurer; J. Walter Barnes, Fairmont, W. Va.,; Dr. J. A. Haven, Brookville, Pa., and E. D. Schade, Johnstown, Pa., excutive commitee.

H. L. Lamb, of California, Pa., read a paper on "Value of Publicity." "Proper Maintenance" was the subject of a paper read by W. S. Paca of Oil City, Pa.; W. H. Wilson, of Erie, discussed "Rural Lines," and E. D. Schade spoke on "Pennsylvania Public Service Commissions."

After hearing committee reports the convention ended early in the afternoon. The next quarterly meeting will be held at Johnstown, Pa.

"Movie" Show Instead of Calendars For Patrons.

The Ohiowa Telephone Co., of Ohiowa, Neb., recently planned a free motion picture show for the entertainment of its subscribers instead of the calendar usually sent out.

Relation Between the Valuation and Rate of Return

Factors Which Enter into Valuations and Considerations in Fixing the Returns for Interest and Profit on Valuations—Methods of Determining Cost Values—Paper Presented at Annual Convention of National Association of Railway Commissioners

By Halford Erickson

When asked to prepare a paper on the relation between the valuation and the returns thereon for interest and profit, the first thing that occurred to the writer was that, since this relation is the result rather than a cause of such value and such return as may be determined upon, the best way to discuss it was through those facts upon which the valuation and the returns depend, and in connection with the rules and methods under which these facts are ascertained. The relation between the valuation and the returns is not one of the leading elements upon which, as a rule, either the value or the returns directly depend. It does little more than show the ratio between the sacrifices of the investors on the one hand, and the amount of their rewards for those sacrifices on the other. Under normal conditions at least, the valuation as well as the returns thereon are for the most part determined from facts and conditions which are largely independent of the relation in question.

Valuation, The Fair Present Value.

Under the law, as interpreted by the courts, it appears that, under normal conditions, the valuation fixed on property of public utilities that is used and useful in the service, and on their business, should be the fair present value, and the returns allowed thereon for interest and profits should be the amount that is reasonable under the circumstances. The courts go even further. While they hold that the fixing of the valuation is a matter of judgment, they have quite fully outlined the facts and conditions upon which the judgment should be governed.

With respect to the valuation, for instance, it is held that it very largely depends on the original cost and the cost of reproduction of the property, rights and business involved, due consideration being given to depreciation and to the earnings and operating expenses of the plant as well as to certain other factors connected therewith. With respect to the returns for interest and profit on such valuation, it is held that in fixing them, due weight should be given to the returns obtained on capital similarly invested, the price at which money or capital can be had for the plant in question, and other facts of this kind.

Whenever the valuation fixed, is the fair present value, and whenever the returns allowed thereon is the reasonable amount, it would also seem to follow that the relation that obtains between such valuation and such returns is also reasonable. There may, however, be those who seriously question this and who feel that it is better public policy to fix the valuations either at a higher or at a lower figure than this, even though in order to do so, it may be necessary to make corresponding changes in the returns. What I mean by this may be further illustrated.

To an investor serving the public who, under normal conditions, is entitled to say $6,000 annually for interest and profit on an investment of $100,000, it would perhaps not make a great deal of difference whether he thus received 6 per cent. on $100,000, or 5 per cent. on $120,000, or 7.5 per cent. on $80,000. His total receipts would be the same in either case. In this case, however, $100,000 represent the fair present value of the plant obtained from such facts and conditions as those just outlined. This value is also likely to represent the fair value, not only for rate making, but for capitalization, and barring possible damages for condemnation purposes.

The other two values, that of $120,000 and that of $80,000, differ from what was thus said to be the fair value. These differences, it would seem, can hardly be justified on the facts. Under ordinary conditions neither one of these two values would seem to be fair, either for rate making, capitalization, or condemnation purposes. To fix a different value and a different return thereon, then the fair value and the fair return would hardly seem just, except under abnormal conditions. To do so may not only be unjust today, but it may open the door for deceptions and false claims and representations in the future.

On the other hand, when the conditions are abnormal or unusual, it may be necessary to consider facts and conditions which otherwise would be of less importance, and among these the rate of return that can be fairly applied may be an important factor. Such conditions, however, are out of the ordinary and, when met with, should be treated on their special facts. These statements are based upon rather careful analyses of the facts and conditions that are involved in determining such values and rates, and upon the methods by which these facts and conditions are obtained. These analyses will be explained at some length.

Original Cost of Plant and Business.

The original cost of the plant and of its business may be defined as the amount of money judiciously expended on the property used and useful in the service, and on the development of the business. The cost of reproduction of the plant and its business, may be said to be the amount of money which would have to be expended at present in order to obtain a property or plant and business that is identical with the plant and business to be appraised.

The cost of the physical plant or property which is thus translated into value, includes all necessary and judicious outlays that must be made to obtain the same. They cover the cost of land, labor, material and equipment of all kinds that are required in order to obtain a complete plant ready for operation. They also cover such overhead costs as organization, legal expenses, engineering and superintendence of construction, insurance, contingencies and interest during the construction period on the capital used.

When a public utility plant is needed by a community and cannot be had on better terms, its cost, in addition to the items named, may also have to include something in the way of promoter's expenses; and even a greater than the usual allowance for interest on the capital during the construction period, or for such discounts on the securities upon which the capital is obtained, as are not covered by the allowance which was made for interest during construction, and which discounts are not due to the fact that these securities may bear lower than the regular rates of interest, and other similar causes.

Now it appears that the outlays which have thus been outlined and which enter into the cost of the plant will, when summed up, point to one specific sum as the cost of this plant. It will not show that this cost is $100,000, $120,000 and $80,000, but that it was one only of these amounts, or that it agreed with some other amount. It appears further that if there are no errors therein, the total cost thus shown is the cost that should be considered in determining the fair present value of the plant.

The original cost should be found in the books and records of the utility. Unfortunately, however, these records are often not only loosely kept, but entirely missing. While it is both possible and practicable to so enter all construction costs and so record all subsequent renewals and displacements that the books will show the true original cost, it is a fact that the records are not always so kept. Many plants have also had more than one set of owners and may have passed through one or more receiverships and reorganizations. All of this greatly complicates matters and makes the original cost more difficult to ascertain, but it does not change the purpose for which it is required.

But even when the books and records have been kept and preserved, they do not always show the true cost. Thus it is not uncommon to find that the amounts given for such items as the cost of organization, promotion, rights and franchises are wholly out of proportion to the outlays that were actually made for these purposes. In many cases, for instance, these items are simply arbitrarily raised to a figure that is high enough to offset or furnish a basis for such stock issues as it is desired to make. There are also instances where other items of cost than those mentioned may be treated in a similar manner.

Excessive Charges.

Excessive charges of this nature must of course be ascertained and eliminated in order to obtain the true original cost, but such eliminations simply represent the correction of errors. Such corrections must also be made when the original cost, as shown on books, is excessive because of lack of foresight and efficiency on the part of the management, or because of incompetent or inadequate engineering and legal advice, and for other similar reasons. To allow higher than reasonable charges for such purposes as these, might tend to lower the standards of efficiency and economy, and thus be out of line with public policy.

Following the same course of reasoning, it would not seem out of line with public interest to encourage exceptional efficiency and foresight by them including items, at their normal cost, which may have been acquired at exceptionally low prices. To discover excessive costs, as well as lower than normal costs of this nature, and to fairly adjust the original cost accordingly, require careful investigation and sound judgment, and is one of the most effective aids in finding the true cost.

Failure to distinguish clearly between items that are properly charges to construction and items that should go into the operating expense, is another feature that makes careful examination of the construction accounts highly necessary. Construction should be charged only with such items which permanently increase the value of the plant. Disregard for sound practices in this respect has often resulted in the abnormal swelling of these accounts. Proper adjustments of such errors will also be of material assistance in finding the true cost.

The price paid for material, labor, and other factors are also of the greatest importance in determining the true original cost of public utility property. Besides the ordinary market fluctuations, there seems to be a regular movement of prices, either up or down, forming a complete cycle over a period of years. During the past decade and a half, for instance, there has been a general increase in prices, which naturally has affected the cost of construction. Plants constructed during high prices will show a higher original cost than those built when prices are low. To what extent, if any, such variation in costs should be considered, is by no means clear.

When the plants are constructed to meet public needs and when deemed of as great or greater value than their cost; when those who furnished the capital did so in good faith; and when ordinary judgment was used in all matters pertaining to the undertaking, then it would seem that there is little room for questioning the fairness of the actual cost. When on the other hand plants are constructed under conditions as to prices that are so abnormal as to result in undue burdens to some of those interested, and in undue advantages to others, then it is quite probable that adjustments of the cost for purposes of valuation may become necessary.

The original cost of public utilities is probably somewhat affected by the fact that they are seldom completed in one continuous process of construction. Such utilities are usually growing with the place or city in which they are located. This piecemeal construction, like all retail business generally, is supposed to be relatively more costly than if the entire plant had been built in one continuous operation.

In most cases the cost is no doubt relatively lower when business is done at wholesale than at retail. Yet we find that new extensions are often entirely planned and supervised by the operating force of the plant which is already organized and which is merely performing these duties in addition to their other duties and without, perhaps, adding much of anything to the total expense. In this way the cost of engineering, supervision, and management may become even relatively less for extensions than for the original part of the plant. This might also be true of interest during construction; for the reason that the rates of interest and discount are usually higher for a new and untried enterprise than for a going established concern.

The construction of new plants of considerable size is also, as a rule, interrupted by the seasons, and the effect of this may not differ materially from interruptions between each extension of the plant. For these reasons it is not certain that the extensions are always any more costly, relatively, than the original part of the plant, or that plants which have been enlarged from time to time are always relatively more costly, than if they had been built in one continuous operation. When conditions are such, however, as to indicate that extensions have cost more relatively than the original part of the plant, it would also seem fair that this additional cost should be taken into consideration.

Original Cost of Existing Property.

But the books and records of a utility are not the only place where a basis for determining the original cost of the property may be had. The original cost of the property is mostly represented by the cost of the property actually in use at the time. From a complete inventory of this property such as must be had in order to determine the cost of reproduction, and which shows the year when each part of it was put into service, and from facts giving the market prices of material, equipment, labor and services of all kinds, and of other needed elements for these years, it is possible to compute the original cost of the existing property with as much accuracy as its cost of reproduction may be ascertained. When in addition to these facts, full information is also available showing the size, location, growth and character of the plant and the kind of services it furnishes, the true original cost can often be more correctly obtained through these and other similar methods than in any other way.

When each of the items which enter into the true original cost have thus been examined and tested, it follows that the final result that is obtained, will represent the true rather than the actual original cost, or any other cost. This true original cost is the figure that should be considered in the appraisals, and is one of the most important factors that enter into the fair present value of the plant. What has thus been said about the significance and meaning of the facts which govern the true original cost, can also be in substance repeated of the facts which govern not only the cost of the reproduction of the plant but of the facts which govern depreciation, as well as those upon which the original cost and cost of reproduction of the business are determined. That this is the case appears from the facts themselves.

Cost of Reproduction.

In order to determine the cost of reproduction new, it is necessary to obtain a complete inventory of the property that is used and useful. Such an inventory must ordinarily be secured by actual inspection and enumeration and should include all the different parts of the property, together with all other necessary outlays that had to be met in order to secure the plant. The next step is to find a suitable price per unit for each class of property, including of course the overhead expenses. The sum of the cost of all these elements represents the cost of reproduction.

In determining the cost of reproduction, the question arises as to what prices shall be used. Some hold that the average prices during the period of construction are the fairest; others hold that current prices only should be used; and there are also many who think that average or normal prices are the ones that should be adopted. There appears to be no uniform practice on this point. It is probable that the choice of prices is a matter that should be governed largely by the conditions in each case. It is likely, however, that prices which represent normal conditions will yield the best result.

Depreciation.

Neither the original cost nor the reproduction cost new, of a plant may be a fair measure of its present cost value unless the depreciation that has taken place in the plant has been provided for and goes with the plant. Depreciation is a natural and inevitable loss of efficiency and value that takes place in practically all parts of public utility property, except perhaps land. It is caused by wear, tear and general decay; by inadequacy resulting from the failure of machinery and other parts to adequately meet increasing demands upon the plant; and by obsolescence, or through the inventions and discoveries of new machinery and methods by which existing equipment has to be superseded.

All of these causes are often at work in the same plant and the amount by which the property has thus been lowered in value by such depreciation at the time of the appraisal should mostly be deducted from both the original cost and the cost of reproduction new, of the physical property and plant. The result of this is that both the original cost and cost of reproduction new, are in a sense brought down to date, and that the respective present cost values of the plant under both methods is obtained. The present values as thus obtained, even when the one is greater than the other, furnish good evidence as to the approximate present fair value of the physical property alone.

Cost of the Business.

When the value of the physical property of the corporation has finally been determined, there remains still another cost which often is legitimately a part of the investment on which reasonable returns should be permitted. This is the cost of developing a business. The most perfectly equipped utility plant in existence is useless if it has no customers. The acquisition of customers is a costly process. It involves not only the expense of advertising, soliciting, experimental service, and other actual outlays, but it may include the amount by which the plant, during the first few years of its operation, fails to pay operating expenses and a reasonable return on the investment.

This latter amount may be to some extent offset by exorbitant profits after the plant reaches a paying basis, or by the fact that failure to earn a return may be in part due to poor management, or lack of ordinary business judgment. But when all deductions have been made for such circumstances, there will usually be found at least for some utilities a steadily decreasing deficit for the first years, which in part at least may be fairly chargeable to the cost of developing the business. This deficit or expense, being a large part of the cost of a successful public utility plant, is, as a rule, properly added to the present cost value of the property. It is sometimes termed going value, but is more properly the cost of building up the business.

The original cost of the business, however, may be only one of the elements that enter into its value. In this case the same as for the physical property, the cost of reproduction under existing conditions should also be considered. The cost of reproducing the present business can be rather closely estimated when full data is available bearing upon the number and density of the population, its familiarity with the services rendered, the probable time it would take the new plant to acquire the present business of the old plant, the earnings and operating expenses of both the new and the old plants, and other facts of this nature. As the business could probably be reproduced in shorter time than it was originally developed in, it is also probable that this cost of reproduction would be less than the original cost. Both items, however, are important in this, that they throw a great deal of light upon the probable cost and value of the business.

For both the plant and the business there are usually some differences as between the original cost and the cost of reproduction. These differences vary with the condition and are much greater in some instances than in others. They are mostly due to such changes in the prices in the several elements that enter into the costs, as may have taken place between the time it was reproduced. These costs, together with the necessary working capital and such other necessary and judicious outlays as may have been made, are certainly important elements in the appraisals. They furnish in fact the best and most satisfactory evidence upon which the commission under normal conditions, must rely in determining the fair present value of the plant and its business. They are also important guides in fixing values under abnormal conditions, although in such cases they may not be controlling.

(To be Concluded.)

Cut-Over to New Toll Switchboard in New York City.

On January 24 the long distance switchboard which had been in service for 14 years in Dey street, New York City was cut out, and the entire long distance telephone traffic of the greater city and nearby towns was cut-over to the new switchboard in the New York Telephone Co.'s new building, occupying the block between Walker and Lispenard streets, and which was built at a cost of more than $1,700,000. The new board, the construction of which was started two years ago, is said to be the largest in the world. The board accommodates 500 toll lines entering the city and some 1,500 trunk lines running to the various local offices.

A large part of the long distance lines are equipped to permit their use for telegraph as well as telephone traffic. In the new switchboard there are 44 test and Morse board positions, 31 telegraph repeater sets and 128 telegraph duplex sets—the largest layout of its kind in the world.

The present number of long distance calls sent out from New York in a day is about 6,400, while there are about 6,000 incoming calls each day. The telephone company considers as long distance calls those for a point further away than an arbitrary radius of about 33 miles from New York. The operating force in the new office is made up of 335 operators of whom 225 are on duty between 8 a. m. and 5 p. m.

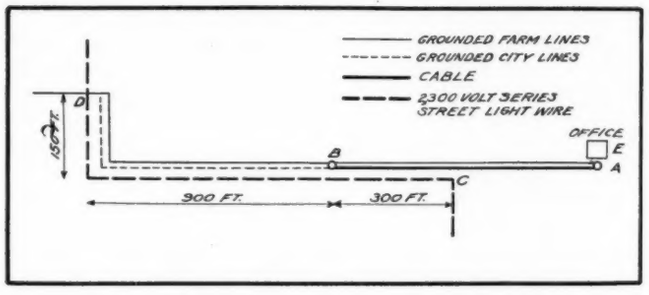
Taking Messages for Subscribers in England.

The English Postmaster general is said to be considering the feasibility of adopting an arrangement by means of which a telephone subscriber, on payment of a small annual charge, may have messages from callers who ring up during the subscriber's absence from home taken down by the operator at the exchange and forwarded on his return. The system is in operation in France.

Queries on Theory and Practice

Grounded Lines and Arc Circuits.

We have 10-foot alleys and our telephone lead is on one side and now the electric light company has built its line on the other side. We have a cable from our office *A* to *B* and our city lines are grounded from the cable box out. We also have 10 grounded farm lines one block farther than our city lines and the total distance is not over 1,250 feet or from *C* to *D* in the sketch. The lighting company has a three-phase, 110-volt current for a residence supply and a 2,300-volt, series, street circuit carrying 27 lamps, the lamps on an average being of 110 watts. We get no noise from the lighting circuits ex-



Distribution of Lighting and Telephone Circuits.

cept when the street lights are on. It does not seem possible that for such a short distance which we parallel each other, we could get so much noise. As this is the only way we have for our country lines, we would like to know what we can do to get away from the noise.

The series arc light circuit is the worst noise producer known to the telephone man. You can not get rid of the noise unless you put in metallic circuits as far as you parallel it. There is no other alternative as long as you must stay in the same alley.

The reason for the bad induction from the series arc circuit, is that there is no neutralizing effect to be had from the return wire of the circuit; and even if it were carried back on the same lead, the arc circuit is so badly unbalanced that noise is sure to result. The lamps are spaced along each side of the circuit without regard to keeping it in balance.

Case of Cross Talk in Magneto Exchange.

A magneto exchange, which was built last summer, has the most disturbing cross talk and cross ringing that I ever came across in years of practical experience and I am ready to admit I am "stumped" in my efforts to clear it up. The exchange has about 125 subscribers. All city subscribers are on straight metallic lines. Eight country or farm lines come into the distributing frame on No. 17 gage copper clad wire. From the office pole to the distributing frame the circuits are grounded but they are metallic from the frame through the cable to the board. All city lines come in through standard lead covered cable from the office pole to the distributing frame—metallic circuits. The office ground consists of two No. 10 copper wire coils (30 lbs.) in nine feet of earth.

Any country line usually throws from four to six country line drops, and at the same time, usually rings almost every farmer's telephone on the exchange—some more distinct than others. In fact as it is, farmers just ring the code signal of the subscriber they want and it is not always necessary to go through cord circuits at all. Some of these cross talks and cross rings are nearly as distinct as a connection established through the cords direct. The country lines do not parallel. Those in opposite directions suffer some disturbance.

When all farmers' lines are disconnected from the distributing frame, the disturbance among those lines is just the same as when cut through to the board, thus proving that the switchboard is not the cause. The cross talk is heard on the metallic city lines distinctly enough to interfere with good service, however, of course, faint as compared to the farmers' lines. That is, the city lines do not disturb each other, but are disturbed by farmers' lines. Have made receiver and battery tests to be sure the city lines are free from all grounds. All carbons are clean.

Such a bad case of cross talk and cross ringing can be located only by careful testing. We recommend, for trial, giving each farmer line its own ground rod, in good moist earth and several feet apart from the other rods. This should settle the question of common ground resistance.

Make the above test as before, with all the farm lines cut off at the line side of the main distributing frame. If the cross ringing ceases, it must be due to high resistance in the common ground. Be sure that you get into *moist* earth. Any amount of copper will not help matters, if the ground is dry. Perhaps you are hindered by the resistance of rock underground. Cases like that have been known.

Try these suggestions and report. We will be glad to follow your results.

Wire Chief's Desk in a Small Exchange.

In TELEPHONY of December 13, page 40, is a circuit for a "Wire Chief's Desk in Small Exchange." I would like to know what kind of a shunt is used in this circuit, also the different keys and where I can buy them.

The shunt is made of some constant resistance wire, such as manganese or "Advance." Use double silk covered wire. See our advertising columns for supply houses which sell it.

The resistance of the shunt should be such as will make the joint resistance of the voltmeter and shunt about equal to the resistance to be measured, 500 ohms is a good value, although some prefer it smaller.

The desired shunt resistance is calculated as follows:

Let R = desired joint resistance of shunt and voltmeter.

V = voltmeter resistance.

S = resistance of shunt alone.

Then $S = \frac{Rr}{r-R}$.

Example: Voltmeter 20,000 ohms = r. Joint resistance, 500 ohms = R.

$$Rr = R \times r = 500 \times 20{,}000 = 10{,}000{,}000$$

$$r-R = 20{,}000-500 = 19{,}500.$$

$$\frac{Rr}{r-R} = \frac{10{,}000{,}000}{19{,}500} = 10{,}000{,}000 \text{ divided by } 19{,}500$$

$$= 513 \text{ ohms} = S.$$

Hence, a 513-ohm shunt connected in parallel with a 20,000-ohm voltmeter will give a joint resistance of 500 ohms. This joint resistance, R, is the one which must be used in the usual formula for computing unknown resistance measured by the voltmeter method.

The keys may be obtained from the various telephone manufacturing companies.

Conditions for Phantom Circuits.

Is it practicable to make a phantom circuit out of a No. 8 iron wire, working a local telephone to phantom and the telegraph circuit at each end?

A phantom circuit can not be made out of one telephone of any kind. Two wires are needed, using them as a metallic circuit for the telephone. The telegraph can be simplexed onto this by using a pair of bridged impedances at each end of the line.

The railway composite telephone is a circuit for attaching two or more telephones to a telegraph line. It is even then very noisy and not to be used except for emergencies. For circuits, see McMeen & Miller's 'Telephony" or Van Deventer's "Telephonology."

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Central Union Receivership.

Judge Dever of the Superior Court at Chicago on January 31 approved the three receivers mutually agreed upon by the parties concerned in the suit of the minority stockholders of the Central Union Telephone Co. in Illinois, and appointed them as receivers for the company to maintain the status quo during the course of the litigation. As previously stated, the receivers named are David R. Forgan, president of the National City Bank of Chicago; Edgar S. Bloom of St. Louis, vice-president of the Bell telephone system in Missouri, and Frank F. Fowle, consulting electrical engineer in New York. Each furnished a bond of $10,000. John J. Herrick was appointed attorney for the receivers.

In commenting on the appointment of the receivers Stephen A. Foster, counsel for the minority stockholders, said:

"Now that receivers are in control of the company, our next step will be to press our suit for an accounting. Defendants' counsel have agreed to produce for examination in open court all the officials of the American and Union companies, except President Vail, whose testimony will be taken by deposition in New York. On this hearing the court will be asked to decide two issues:

"First—Whether the $5,200,000 par value stock of the American company is illegal and void.

"Second—Regarding the general principles to be followed in the accounting to be had between the American company and the Union company, which accounting, it is admitted by all, must be had."

The defendant officials have until April 15 to file a cross bill to the original bill of the complaining minority stockholders.

The attorneys representing the minority stockholders filed application for a receivership for the Indiana properties of the Central Union company before Judge Orbison of the Marion County Superior Court at Indianapolis, and John A. Moriarity, heretofore general manager of the Indianapolis Telephone Co., was named as receiver. Mr. Moriarity severed his connection with the Indianapolis Telephone Co. immediately on notice of his appointment as receiver in charge of the Bell company in Indiana. Mr. Moriarity says that he has no plans with respect to his new work.

In Ohio receivers for the Central Union Telephone Co. were appointed in the Common Pleas Court, at Columbus, on February 2, on application of E. A. Reed, general manager in Ohio. The court appointed the same receivers named by the Chicago court to be auxiliary receivers in Ohio. An official statement, given out at Columbus, declared the operation of the company's business would not be interrupted.

Coincident with the appointment of receivers in Chicago, independent application for a receiver for the company in Indiana was made before Judge Rochford in Indianapolis, by Christopher Hearn, who holds one share of stock. A similar application was filed by Hearn in Toledo, Ohio.

New York Telephone Co. to Supply Appraisal Funds.

At a conference on January 30 at Albany, N. Y., between Frank H. Bethell, vice-president of the New York Telephone Co.; Chairman Decker and other members of the Public Service Commission, and Senator James A. Foley, chairman of the joint legislative committee appointed to investigate telephone rates, Mr. Bethell promised that the telephone company would create the proposed fund of $150,000 to meet the cost of appraisal. This promise was made after receiving assurance that the appraisal would be conducted by Mr. Decker without interference from the legislature or politicians.

Senator Foley said that the members of his committee would be glad to have Mr. Decker select experts to make the appraisal and assume undivided responsibility for the work. It was agreed that the disbursements of the $150,000 would be upon the approval of Senator Foley, as chairman of the legislative committee, as well as Chairman Decker, of the Public Service Commission.

Bill to Fix New York Telephone Rate.

Assemblyman Flamman recently introduced a bill in the New York Legislature inserting in the transportation corporations law a new section making five cents the maximum charge for a telephone call of not exceeding five minutes' duration within the city of New York.

Bill to Permit Telephones in New York Subways.

A bill has been introduced in the New York legislature to allow telephones to be installed in subway and elevated railway stations in New York City.

Probable That Louisville Will Accept Bell Offer.

First Assistant Attorney J. W. S. Clements, of Louisville, Ky., has completed a tentative draft of an ordinance repealing the maximum rate ordinance of the city and substituting the schedule of telephone rates contained in the Cumberland Telephone & Telegraph Co.'s compromise offer referred to in last week's issue of TELEPHONY.

Special emphasis is put in the tentative measure upon the right of the city to regulate the Cumberland company at any time. Before the measure is finally completed and offered to the general council for passage it will be considered by Mayor Buschemeyer and officials of the Cumberland company. The drawing of the ordinance indicates that the compromise offer will be accepted with binding recognition of the city's right to regulate.

New Secretary of Illinois Commission.

R. M. Feustel, who for several years has been connected with the engineering staff of the Wisconsin Railroad Commission, has accepted the position of chief engineer of the Illinois Public Utilities Commission, at a salary of $6,000 a year. He will leave Madison shortly to assume his duties. Recently A. L. Harrup, of the Wisconsin commission engineering staff, was chosen as chief engineer of the Missouri commission. Wisconsin also furnished the secretary of the Illinois commission, when Prof. Doolittle, who has been employed by the commission for several years, accepted the offer which was made to him.

Council Bluffs Subscribers Must Pay Franchise Tax.

Judge Rockafellow, of Council Bluffs, Iowa, has dissolved a temporary injunction granted against the Independent Telephone Co., of Council Bluffs, Ia., to prevent the removal of instruments on which subscribers refused to pay the franchise tax of 5 per cent. exacted by the city. The company showed that it had 5,500 or more subscribers whom it was charging $4.20 per month, including the franchise tax, whereas the ordinance permitted the company to charge $4.75 per month.

The court held that the company could charge any rate that did not exceed the rental charge allowed by the ordinance.

It was agreed that the injunction should remain effective until February 15 as the complainants, Dr. Donald Macrae, O. J. McManus and W. H. Killpack, notified Judge Rockafellow of their desire to seek a restraining order from the supreme court.

Detroit Selects Telephone Expert.

A committee composed of Mayor Marx of Detroit, Corporation Counsel Lawson and Alderman Lodge recently agreed upon Charles L. Zamm, of Detroit, as the city's telephone expert to assist the corporation counsel in fighting the applicaeion of the Michigan State Telephone Co. to the Michigan Railroad Commission for permission to install measured service in Detroit. Hearing on this application began on January 28, but the city and company joined in asking the commission for a month's adjournment—two weeks to enable the company to prepare an inventory of its plant and equipment and two more weeks to prepare a sworn appraisal of its properties. The hearings were adjourned by the commission until February 25.

Suit to Annul Franchise at Traverse City, Mich.

Because it is charged the Citizens' Telephone Co., of Grand Rapids, Mich., has broken the terms of its franchise at Traverse City, Mich., through raising rates, the common council of that city has instructed its city attorney to bring such proceedings in chancery as are necessary to obtain the forfeiture of the franchise. The action was taken upon the recommendation of a citizens' committee.

Authority of Michigan Cities to Require Franchise.

That any telephone company in a fourth class city in Michigan, operating without a franchise, may be compelled to accept one from the city in which it operates, is the substance of an opinion which has just been handed down by Attorney General Fellows of Michigan.

Wisconsin Indeterminate Permit Law Valid.

The effect of a decision which has been rendered by the supreme court of Wisconsin in passing on the controversy between the Wisconsin Traction Light, Heat & Power Co., and the city of Menasha, is to sustain the validity of the law passed at the 1911 session of the legislature making all franchises in the state indeterminate permits. This is the view of Chairman John H. Roemer, of the Wisconsin Railroad Commission.

"This decision is of great importance as it sustains the law amending all franchise in the state and making them indeterminate permits," said Mr. Roemer. "The first law, enacted by the legislature on this subject, made it optional with existing utilities to receive indeterminate permits. As very few corporations were able to surrender, because they could not get the consent of their bondholders, the legislature in 1911 amended all franchises of public utilities in the state, making their franchise indeterminate permits. The decision in the Menasha case sustains the validity of that law."

Although thirteen cities of the state have purchased the properties of public utilities under the indeterminate permit law, all were under the first enactment permitting the company to voluntarily take out an indeterminate permit. The latter law has sometimes been questioned, but the decision of the court clarifies the situation.

Hearing Before Canadian Commission at Toronto.

The question of whether the Bell Telephone Co. of Canada will be compelled to provide the citizens of North Toronto with telephone service at city rates, is now in the hands of the Board of Railway Commissioners for Canada. More than a year ago the city of Toronto applied to the board for an order for the application of the same telephone tolls to North Toronto, or the territory recently annexed, as are paid in the city proper, and at a recent hearing at Toronto this was the main question before the board. A deputation of the North Toronto ratepayers was on hand to submit new evidence. A list of 93 people was submitted who would subscribe for telephones if they could get the same rates as people in the former limits of Toronto. It was stated that there were householders numbering about 275 to 300 who would take them at city rates, besides 175 business men.

Corporation Counsel G. R. Geary pointed out that many of the North Toronto residents are business men who pay for a telephone in the "short haul" area, but because they live outside that area they are discriminated against for their house telephones.

Mr. Geary contended that North Toronto was comparatively near the centre of population now of the city, showing by a map that the centre would be, in his opinion, about the corner of Yonge and Bloor Sts. Kenneth J. Dunstan, general manager for Toronto of the Bell Telephone Co. of Canada, considered the centre to be nearer Bloor and Bathurst Sts., more than a mile west of the former point, while the chairman of the board, H. L. Drayton, former city solicitor of Toronto, was inclined to place it at College and Bathurst, half a mile south of the latter point.

The present rates are $30 and $50 in the city, while North Toronto is charged $40 to $120. The company has bought property, it was stated, on Eglinton Avenue, in North Toronto, but Mr. Geary supposed it would do nothing with it so long as it was allowed to charge the present tolls, which he argued were exorbitant. He claimed that there was an absolutely unfair discrimination against North Toronto. The company has exchanges east and west, and should establish one, he declared, in the district of North Toronto.

Mr. Dunstan admitted that an exchange in North Toronto was inevitable in time, and that it meant an initial outlay of about $150,000 to connect up with the 54,000 telephones in Toronto. He further claimed that small exchanges were more costly than larger ones. As to the list of names submitted he remarked that there was difference between a petition and a contract. The board reserved its decision.

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

Decision No. 1147: Supplemental order correcting error in previous order and making 350 instead of 300 miles the maximum distance between block centers in computing air line distances for toll rates in California.

Decision No. 1157: Granting Pacific Telephone & Telegraph Co. a certificate of public convenience and necessity to construct and operate a telephone system in the city of Eagle Rock.

Decision No. 1168: Denying application of Fowler Independent Telephone Co. to increase rates in accordance with schedule submitted, but holding that present rates are not compensatory and prescribing rates and conditions under which such rates may be charged, effective January 1, 1914.

Decision No. 1169: In the case of M. Farrell, *et al.* vs. the Pacific Telephone & Telegraph Co. holding that the interchange switching privileges afforded Mountain View and Los Altos exchange subscribers constitutes a just and reasonable exchange area and requiring the defendant to install within three months battery equipment in place of magneto type now in use in Mountain View. Complainant's petition to be incorporated with either Palo Alto or San Jose exchanges denied.

January: Authority granted to the Home Telephone & Telegraph Co. of Santa Barbara county to issue promissory notes in the sum of $15,000 and to pledge its bonds in the sum of $27,000 as collateral security therefor.

January 14: Hearing held in rehearing of the San Jose rate case. C. G. DuBois, comptroller of the American Telephone & Telegraph Co., testified that the actual cost of the service supplied by the Bell system to the Pacific Telephone & Telegraph Co. for the first eleven months of 1913 was $727,161 and that his company received in the form of 4½ per cent. of the Pacific company's gross receipts about that amount for the service. The cost to the Pacific company, if it were

compelled to provide the same service for itself, would be $1,300,000. Mr. Dubois testified that the parent company had twenty subsidiaries. H. D. Pillsbury represented the telephone company and J. W. Sullivan the city of San Jose.

January 16: Hearing held at Modesto by Commissioner Alex Gordon on complaint of ranchers on the farmer's lines out of Modesto against the Pacific Telephone & Telegraph Co. on account of alleged discrimination and excessive rates. Testimony showed that while some of the ranchers are paying an annual toll of $7.20 others are paying but $3. In some cases as high as 10 subscribers on a single line are each paying $7.20 annually, while in Modesto the annual charge for a single circuit is but $36. This is said to have been the first case of the kind brought before the commission. The commissioner decided that each side should present its case by briefs.

January 20: Hearing at Santa Rosa on the application of the Fulton Telephone Exchange, owned by private individuals, to sell its rural lines and business to the Pacific Telephone & Telegraph Co.

January 23: Request by Pacific Telephone & Telegraph Co. for extension of time to March 1 in which to put into effect the company's new long distance toll rate throughout the state.

INDIANA.

January: Application by William Fortune, president of the Indianapolis Telephone Co. for authority to establish a new four-party rate of $15 in Indianapolis. It is believed the commission will approve the rate.

February 16: Hearing at Logansport on the application of the Logansport Home Telephone Co. to increase rates.

Date not fixed: Hearing on petition of 150 Indianapolis citizens for a merger of Bell and Independent systems.

KANSAS.

January 22: Order granting the Salina Telephone Co. and the United Telephone Co. of Abilene permission to consolidate under the name of the United Telephone Co., and granting permission to the new company to take up the stock in each company, amounting to a total of $600,000, and to issue stock of the consolidated company to the amount of $925,000.

LOUISIANA.

January 22: Complaint to commission as the result of an announced increase from $3.50 to $5 per month in the rates of the Cumberland Telephone & Telegraph Co. for party-line residence service at Iola, La.

MASSACHUSETTS.

February 5: Hearing on petition of the United Improvement Association to require the New England Telephone & Telegraph Co. to maintain its four-party and six-party service, because of its cheapness.

MICHIGAN.

January 31: Application by Attorney John J. Tweddle, of Traverse City, for an order requiring physical connection in the vicinity of Traverse City between the Citizens Telephone Co. and the Michigan State Telephone Co. It is charged that Manistee, Charlevoix and all points north cannot now be reached over the Citizens telephone.

February 25: Adjourned hearings on application of the Michigan State Telephone Co. to install measured service in Detroit.

MISSOURI.

February 16: Hearing on increased telephone rates by the Southwestern Telegraph & Telephone Co. for St. Louis.

NEBRASKA.

January 18: Order authorizing the Platte Valley Telephone Co. to reduce its toll rate between Gering and Minitare.

January 18: Order authorizing the Nebraska Telephone Co. to close its toll booths at Arabia and at Altoona where the business does not pay the expense of keeping the booths open.

January 18: Order authorizing the Deweese and Lawrence telephone exchanges to make a rate of 50 cents a month to each subscriber who desires to accept service between the two exchanges.

January 27: Order authorizing increase in the rates of the Lincoln Telephone & Telegraph Co. for its exchanges in the towns of Adams, Cook, Crab, Orchard, Graff, Sterling, Elk Creek and Tecumseh, in Johnson county; permitting discontinuance of the Vesta exchange and restricting the service of each exchange in the county to its own immediate territory.

January 29: Order authorizing the Banner Telephone Co. of Seneca to issue $2,000 of stock for construction, and completion of the telephone plant.

NEW YORK.

January 23: Order authorizing the Mountain Home Telephone Co. of Saranac Lake to refund to subscribers various amounts paid by them for toll service in excess of the schedule submitted by the company to commission and made effective in March, 1913.

February 6: Hearing at Buffalo by Commissioner Hodson on complaint of the Hamburg Business Men's Club against the Federal Telephone & Telegraph Co. in the matter of rates between Buffalo and Hamburg.

OHIO.

January 23: Application by the Athens Home Telephone Co. for approval of a preferred stock issue of $35,000, the proceeds to be used to purchase a building in Athens, to extend the toll line to Parkersburg, W. Va., and to make other improvements.

January 29: Order No. 104 authorizing a physical connection in accord with joint application of W. C. Hunter, of Brinkhaven, Ohio, and the Central Union Telephone Co. and requesting that a schedule of reasonable rates covering such interchange service be filed.

OKLAHOMA.

February 4: Hearing at Durant on complaints of citizens against the alleged excessive rates of the Pioneer Telephone & Telegraph Co.

February 10: Hearing on application of I. R. Mason, on behalf of the city of Ardmore, for a general reduction in the rates of the Pioneer Telephone & Telegraph Co. in Ardmore. The reductions asked are: Business special line, $3 to $2.50; business two-party line, $2.50 to $2; residence special line, $2 to $1.50; residence two-party lines, $1.75 to $1.25; residence four-party lines, $1.50 to $1.

February 10: Hearing in case of Keokuk Falls Telephone Co. vs. Prague Telephone Co., respecting adjustment of division of charges.

OREGON.

January 21: Answering a petition of the La Grande (Ore.) Commercial Club asking the commission to require if possible a connection between the Home Independent Telephone Co., of La Grande, and the Eastern Oregon Co-operative Telephone Association, the latter declares that the companies are competitors and that subscribers for the service of one are not subscribers for the service of the other.

PENNSYLVANIA.

February 18: Further hearing on objections of the Bell Telephone Co. of Pennsylvania to the proposed rate schedule of the commission.

WASHINGTON.

January 23: Order giving the Skagit River Telephone & Telegraph Co. 30 days in which to show cause why it should not permit the Puget Sound Independent Telephone Co. to make physical connection with the former's line at or near the east line of the city limits of Sedro-Woolley.

WISCONSIN.

January: Application of the Owen Telephone Co., of Owen, Clark County, Wis., for authority to extend its lines into the towns of Hoard and Green Grove, denied. Objections were entered to such extension by the Curtiss-Withee Telephone Co., a competitor.

February 2: Dismissal of application of Fond du Lac Rural Telephone Co. to extend its lines into the town of Taycheedah, Fond du Lac county, because the Eastern Wisconsin Telephone Co. is already furnishing service in that town.

February 3: Hearing on application of Mineral Point Telephone Co. for authority to increase rates.

February 12: Hearing at Madison on the matter of fixing and establishing reasonable regulations, specifications and standards for telephone service in the state.

February 13: Hearing at Spooner in case of the Earl Telephone Co. vs. the Trego Telephone Co. for alleged violation of the laws of 1913.

February 13: Hearing at Fall River in reference to the investigation and hearing, on motion of the commission, of the service of the People's Telephone Co. and the Wisconsin Telephone Co. at Fall River, Wis.

February 17: Hearing in case of Diamond Grove Telephone Co. vs. the Mineral Point Telephone Co.

February 18: Hearing in case of Hawkins Creek Telephone Co. vs. the Badger Telephone Co. in the matter of physical connection.

February 18: Hearing in the case of the Ettrick Telephone Co. vs. the Western Wisconsin Telephone Co. and the LaCrosse Telephone Co. in the matter of charges for toll messages.

February 19: Hearing in the case of H. W. Johnson *et al.* vs. the Redfield Telephone Co. and the Fremont Telephone Co., in the matter of physical connection.

February 19: Hearing on application of the New Union

February 20: Hearing at Friendship on application of the Friendship Telephone Co. for authority to increase rates.

February 27: Hearing on application of Badger State Telephone-Telegraph Co. for authority to increase rates.

Sparks from the Troubleman's Department

Implicated.

A colored waiter at one of Baltimore's suburban clubs called his sweetheart from an automatic pay station. When the allotted time had elapsed, the operator requested another nickel, and was surprised when he answered: "Look yere, yo' don' know who I is, do yo'?"

This was met by the operator's request for "Another nickel, please, if you wish to continue your conversation." Imagine her amusement when he replied: "I don' inten' to gib yo' any mo' nickels, an' yo' jist git offen dis line—I wants yo' to know I'se implicated in de telephone comp'ny an' if yo don' lemme alone I'll make yo' lose yo' posishun!" —The Transmitter.

Too Much Regulation.

"Where's the president of this railroad?" asked the man who called at the general offices.

"He's down in Washington, attendin' th' session o' some kind of an investigatin' committee," replied the office boy.

"Where is the general manager?"

"He's appearin' before th' Interstate Commerce Commission."

"Well, where's the general superintendent?"

"He's at th' meetin' of th' legislature, fightin' some bum new law."

"Where is the head of the legal department?"

"He's in court, tryin' a suit."

"Then where is the general passenger agent?"

"He's explainin' t' th' commercial travelers why we can't reduce the fare."

"Where is the general freight agent?"

"He's gone out in th' country t' attend a meeting o' th' grange an' tell th' farmers wh we ain't got no freight cars."

"Who's running the blame road, anyway?"

"Th' newspapers and th' legislatures."—Pittsburgh Press.

Dividends Assured.

The cost of food may upward go,
  Although it's now too steep,
But thanks and smiles are quoted low,
  And courtesy is cheap.

Then make your path a pleasant way,
  Through vale or on the height,
And let this wholesome truth hold sway,
  It pays to be polite.

A thank you here, a thank you there,
  A pleasant nod and smile,
Perhaps a harvest rich will bear,
  At least they're worth your while.

And so, whate'er your duty be,
  Big ugly thoughts take flight,
For courtesy is always free,
  It pays to be polite.

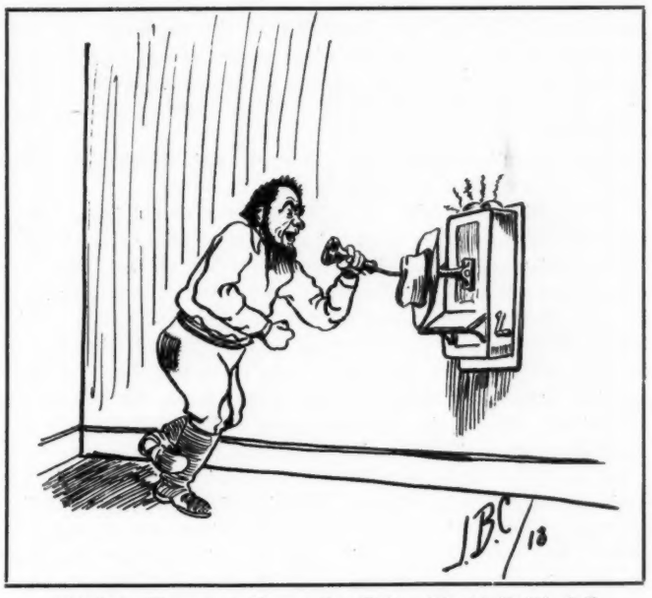
—Cleveland Plain Dealer.

For Grouches!

By Hugh Kahler.

A ripe, old grouch is far too dear to waste it on the folks who pour their troubles down your ear or tell you mouldy jokes. Don't dissipate that precious ire on him who smites your nose, or sets your house and barn afire, or treads your tender toes. You can't afford to spend your store of ugly words and looks on those who thirst to shed your gore or muddle up your books.

Just feed these fellows happy grins that never cost a cent and meet their aggravating sins with low-priced merriment. No matter how they rave and scold and hunger for your hide, your anger's worth its weight in gold, so keep it safe inside; and also save your whole supply of cuss-words, grunts and growls, and treasure every tart re-



"Hello! There! I Knew the Thing Wouldn't Work."

ply and hoard your priceless scowls, and leave your costly temper hid inside a safety vault, and keep your ire beneath the lid and pack your grouch in salt until somebody happens in and writes you out a check, or fills with coal your empty bin up level with your neck, or slips you eggs and motor-cars and other precious things, like bacon, fifteen-cent cigars, new shoes and diamond rings.

Then is the time to lavish out your precious stock of gloom and knock the kindly soul about and beat him with a broom, and give him liberal reward of snarls and grunts and sneers and draw upon your priceless hoard of frowns and kicks and jeers. For he who keeps his own supply of ugly words and deeds, won't thank you for a frown or sigh—he has all those he needs; so save your wrath when he's in sight and never spend a groan until you meet a merry wight who has none of his own.—Wells Fargo Messenger.

A New Complaint.

A subscriber called the central office to report trouble with her telephone, saying:

"I wish you would send some one down to look over my telephone. It has been acting quite badly for several days, till now it has got so that, when I talk over it, it makes my arm ache. I didn't think so much about it until one of my neighbors said it affected her the same way."

No "Niggah Phome" Wanted.

From 'way down in West Virginia comes this one, says The Transmitter:

An installer took a standard desk set around to a colored woman's house and prepared to put it in position. Mrs. Colored Woman came in to look over the new telephone. One glance was enough.

"Go way from heah, mistah, I don't want no niggah 'phome. If yo all ain' got no white 'phome, you kin jest take that thing right out of heah."

Practical Subjects—Letters and Discussions

Letters from a Retired Lineman to His Nephew.

Dear Ben: Podunk Valley Farm.

As I have been telling, Tweedles' case has been worrying Doc a good deal. He has been here quite often of late. Some days he has just watched her for an hour or so, and then ambled off home without saying a word. Other days he has taken her for a walk down by the river; then again he has played with her at the swing in the orchard. All the while the child has been growing more listless, and yet she has all her faculties, except she is no longer a child. She is even losing her childish looks, besides "putting away childish things."

Well I finally tackled Doc about it and asked him if he really knew what the trouble is.

"Well, Dick,' he said, "most any doctor would know what the trouble is. That isn't what bothers the medical men today. It's the causes of the ailments that we are after. I could have relieved her long ago but she isn't suffering, and it wouldn't be a permanent cure. I've been fortunate, Dick. I've had time to study this case as no other physician ever has. They have, in the past, treated such cases first and studied them afterwards. I think I've got to the bottom of it and, if I have, she will be cured. If I haven't we'll relieve the case and let it take its course. It's for you to say.

"I want you to come with me and take the little girl to Chicago next week. Doctor Stolski, the greatest specialist we have, will be there and I have already made an appointment with him for you. It's a good deal like that tree that bothers the wires across the road. You trim it every spring. The real cause of your trouble is under the ground—in the roots. Now, I can tone up Tweedles' nerves, but that still leaves the cause undisturbed. I want to get at the root of the matter, and I'm going to do it, if Stolski is the man I think he is."

So next week we are going to see the great doctor. We haven't even dared think of the cost—I guess we don't care, if it brings Tweedles back to herself.

Yes, Ben, I've been mixed up in all the things you mention—"raising lines temporarily" with a strong accent on the "tempo."

I remember once we shipped the gang 50 miles to raise two spans so a pile driver could be used under the line to build a new bridge. We lashed 15-foot extensions on the poles, cut slack in all wires and boosted them up. It was a pretty shaky job, let me tell you. We hoped to be so far away in three weeks that we would not be sent back to replace the line. That was in July.

That pile driving dragged along until winter set in and the job was stopped 'til spring with the derrick still under the line. The water was too low to move it and they didn't want to go to that expense anyway.

Our gang was the only one left in the field, so we were shipped back. We rebuilt the line around the derrick by moving five poles and doing the necessary guying. We made a permanent job of it and it would probably never have been changed except the next summer, when they built the abutments, the poles had to be moved and we went back and made the necessary changes.

Another time we went to raise a 20-wire line to let a government dredge go up the river. The whole job was very temporary and, after the dredge had passed, we started to let the wires down. An engineer came up to us and said we'd better leave them up as another dredge would be up in a week and both would be going back inside of a month. If a little breeze had come up, those wires would have been out of commission in five minutes. Barker got orders to raise the line permanently.

There are two illustrations of temporary work for you. From them you can judge as to what information and facts you require before tackling such a job.

About the classiest job we ever did Barker engineered. They wanted to dig a ditch under the line. When the steam shovel came to the line, we were there with a reel of emergency cable. The boss of the dredge made room for it on the scow and we carried the two ends to the poles, dead ended the wires, cutting out two spans. They lifted one pole out for us with a stump puller and laid it to one side. Then, as they went along, we reeled up the stock cable. When the derrick was past the line, they gently lifted our reel to the bank and went on their way. We reset three poles to equalize the spans, rolled up our cable and went on our way. The men in the test room didn't know we had started on the job 'til after we reached town and told them it was done with.

As you travel around you will see a good many flimsy jobs of pole extensions. A scantling nailed to the side of a pole and extending up 10 or 12 feet may be all right for a bracket and one wire, but two scantlings nailed, or bolted to a pole, are hardly stable enough to carry a cross arm. Besides there is difficulty in fastening the cross arm securely, to say nothing of the danger in climbing such a framework.

Ordinarily a pole properly loaded and of a size say for a 25-foot line, is likely to fall far short of the requirements of a pole to carry the same load 35 feet in the air. Weak places develop in a line fast enough without building them in.

I think from my experience that it is better to remove the regular pole and use any sort of a pole, even a cottonwood or willow, if the line is to be let down again within a year. Any sort of green timber, if large enough, will carry the line for that period.

But for anything that has a permanent suspicion about it, get hold of real poles some way, or else make a protest that will protect you if an accident happens.

Sometimes you will have to do the best you can with what you have at hand. Don't be backward about arousing a discussion among the gang about what ought to be done. Maybe some ingenious cuss will help you out with a suggestion which had not come into your head.

Guying, of course, can be resorted to. Anyway, where a line jumps abruptly 15 or 20 feet, the high points ought to be guyed. There is one trouble with temporary guying in this kind of work. It must be as good as permanent or better. A guy to a fence post, or rotten stump, is not safe for over night. But good, safe guying may hold a pretty wobbly pole in line. I think that, where the soil will permit, a good patent anchor would be justified in such a case on account of the saving in expense.

I recall seeing ten wires raised to let a house under at a crossroad, by stringing a messenger from a tree to the cupola of a barn on the opposite side of the road and tying the wires in rope hangers to the messenger. I guess there's most always a way, if a fellow can figure it out.

Tweedles is standing by my chair instead of cuddling up on my knee as she used to, so I can't write any more. She still comes for her good-night kiss but waits 'til I give it to her, instead of demanding it. Your Uncle Dick.

The Value of Publicity.

This has been called the age of advertising, says W. R. Rose in the Journal of The Cleveland Engineering Society. I would call it rather the age of publicity. The limelight penetrates the darkest corners. The public demands publicity. It has become a desired thing, a necessity, a safeguard.

The instinct of concealment is as old as the human race.

The caveman hid his half-gnawed bones, or his woman, from the predatory neighbor. That primitive engineer, the discoverer of fire, no doubt concealed the marvel until those publicity agents, flame and smoke, betrayed him. The element of mystery marked many succeeding centuries. Superstition gripped the dawning intellect; abnormal conditions prevailed; the hidden thing was feared and believed in. Nostrums brewed in secret were accepted as cure-alls. Councils behind closed doors ruled the land—as much by terror as by power.

Then came the printing press, gunpowder, books, Columbus, harnessed steam, newspapers, the taming of electricity, the miracles of science. The old order of things, led by ignorance and superstition, slowly drew back into the shadows. Publicity became the standard bearer of enlightenment, the foreloper of progress. Today it is a force that disarms opposition by uncovering it. To oppose publicity is unwise. Sometimes it is dangerous.

Eighty years ago Emerson laid the foundation for that oft-garbled and much-disputed "mousetrap" quotation. Every reader has met with it in some one of its many variations. "If a man write a better book, or build a better house, or boat, or bridge, or make a better mousetrap than his neighbor, though he hide his home in the woods, the world will trample a beaten path to his door."

This is fine, but it isn't in harmony with modern practice. Better mousetraps will find few buyers without the bait of applied publicity. The world is so big, bridges are so many, the public will never learn which is the finer bridge, or the better mousetrap, until informed through publicity channels. The fact is, we are all servants of that exacting master we call the public, whether we design, or execute, or dig—and the master demands an account of our stewardship.

We realize that publicity in earlier years might have greatly increased the sum total of human knowledge. What a satisfaction it would be to know something really definite about that fine old engineer of Syracuse, Archimedes. Then again, we may imagine the royal builder of Cheops saying to his imperial etcher:

"Carve me on yonder slab in pictured phrase the manner in which these great cubes of stone were transported from the quarries and hoisted into place."

Then picture the high priest holding up his hands in holy horror.

"Master, master," he cries, "this is unprofessional!"

So a great constructive puzzle remains a puzzle still.

The old-fashioned man who hides his light under a bushel will merely scorch the receptacle, exhaust the oxygen and disappear unnoticed and unknown.

This is an exploitation of publicity—not advertising. Advertising is publicity's hired man. Publicity is enlightening and entertaining; advertising is a commercialized section in the great field of news and knowledge.

Science, a little obtuse at times, will learn that newspapers are not entirely devoted to baseball and casualties, to politics and gossip. The newspaper reaches out in countless directions. It wants the best that is available and it wants it in prodigious variety. It stretches a warm hand to science. It realizes that the annals of invention and technical achievement put romance to shame. It knows that the soldiers of science, bridge spinners, canal diggers, are the dauntless skirmish line of advancing civilization. The newspaper stretches a hand for your copy, assuring you that the public is interested in your proceedings because they advance public welfare. The newspaper offers you space in its columns, leaving to your judgment the selection of matter best calculated to interest the layman reader. It asks you to refrain in your reports from puzzling technicalities—that the copy reader may rise and call you blessed, and as far as possible to cover a variety of the themes that should make a popular appeal.

To quote from a recent volume on success in business:

"Proper publicity has been the main element in the upbuilding of many big concerns. Want of publicity has been responsible for the failure of companies that merited success in all but their publicity departments. Lack of good advertising has been responsible for exceptionally clever men failing to make progress."

The Telephone in National Forests.

Trees are used as poles where practicable on the Teton national forest, which joins the Yellowstone National Park on the south, with "slip-tree" insulators which are wired to the tree, the telephone wire being permitted to slip through a hole in the center, says the Hailey, Idaho, Times. By reason of slipping through the insulators, the wire may, by collecting slack at certain points, become loose enough to rest against the tree, which tends to ground the circuit. To prevent this, trees are selected for poles in such positions as will form a zigzag course and the wire does not touch the tree.

Snowslides are numerous on the Teton forest and prove a decided menace to telephone poles. To provide the minimum resistance, poles are here set in practically horizontal position, braced by a timber from beneath so that snow and debris will be parted and continue on their way instead of collecting behind and breaking a pole.

Where the trees are used as poles on the Palisade national forest the tops are removed and all of the limbs on one side. Two or three healthy limbs are permitted to grow on the side of the tree opposite to that on which the bracket is attached, in order to continue for a time the life of the tree used as a telephone pole. The policy of the forest service is to avoid topping the trees whenever possible, removing only a few limbs. In open stands of large trees the topping can be omitted thereby greatly cheapening construction. In case of smaller trees, however, it is necessary to remove the top to lessen as much as possible the swaying of the tree-pole by the heavy winds and consequent sawing of the wire in two.

The supervisor of the Beaverhead national forest in southwest Montana has devised a scheme of wood preservation by means of "self-treatment" of the pole before it is cut. In May, when the sap is vigorously running, the lodgepole pine trees to be cut for poles, are barked from the ground to a height of five feet and left standing for eighteen months. By this time the gum is so hardened that it provides a very efficient coating of gum, which, it is believed, will considerably prolong the durability of the pole when set in the ground.

The Telephone as a Credit Index.

Few business men, however humble, attempt to get along without a telephone, says a writer in the New England Telephone Topics. Usually it is so handy for sending or receiving orders that it is the first thing put in a store or factory. That it also may be a guide to the credit man of a house from which the small business man may be buying supplies, is a new idea, which is illustrated by the following incident:

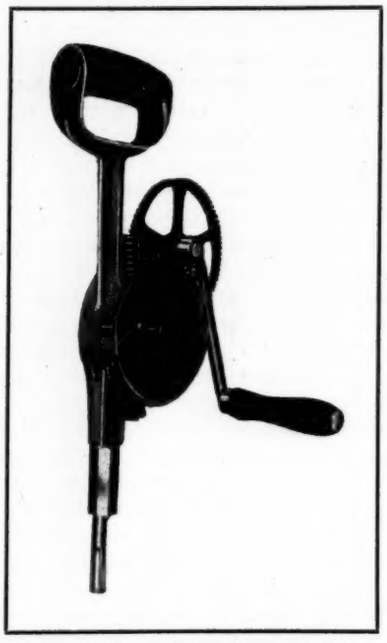
A well known Lawrence, Mass., business man asked the toll operator if she would do him a favor. Upon receiving an affirmative reply, he told her that a man representing a firm from a nearby city was asking credit at his office. Not having any available references, the Lawrence party called the toll operator to see if the firm had a telephone. A telephone was found listed under the firm name. When the toll operator gave the report, the Lawrence subscriber said: "Then I'll give him credit. Any firm having a telephone must be well known."

From Factory and Salesroom

Conventions: Oklahoma Telephone Association, Oklahoma City, Feb. 10; South Dakota Independent, Sioux Falls, Feb. 11, 12; Wisconsin State, Madison, Feb. 11, 12; Illinois Independent, Springfield, Feb. 17, 18, 19; Iowa Independent, Des Moines, March 17, 18, 19

The Drilhammer.

The accompanying illustration is that of a simple, rugged tool for drilling purposes which, when operated at a speed of 75 revolutions of the crank per minute, delivers to the drill 975 blows. The hammer elements of this device are thrown out and held out by centrifugal force, so that approximately



A Device for Drilling Masonry, Etc.

13 blows are struck at each revolution of the crank. Since at the foregoing rate of speed, the hammers travel at the rate of 468¾ ft. per second, very powerful blows are delivered with hammer elements of comparatively light weight. The result is said to be a series of rapid, crumbling strokes, rather than smashing strokes, with the result that a clean hole is made in the shortest possible time. It is declared that this "Drilhammer," as it is called, is a remarkable labor-saving and time-saving device, the construction of which is such as to eliminate entirely springs or rubber and leather buffers and cushions.

As shown in the illustration, the machine has a large cut-tooth steel spur gear which meshes with a small pinion on the shaft of the device. Upon this shaft is mounted a deep forged spider, having pivoted at each end a hardened, tool-steel hammer element. These hammer elements are free to swing upon the spider, with the result that when the tool is revolved they fly around in their paths at high speed, being held by centrifugal force in the proper position to deliver their blows.

At a definite point each hammer element strikes squarely upon the end of the drill, giving up the complete measure of its energy and, turning on its pivot, passes clear beyond the drill shank, after which it is immediately thrown back into place by centrifugal force, ready for the next blow. Two blows for every revolution of the spider are obtained. The latter is four inches in diameter in a small machine of this type, and the gearing, being 1 to 6.25, the hammer elements travel at a velocity that develops very powerful blows. It is claimed that the delivery of the blow is such that there is no "back kick" when in operation, which insures comfort in the operation of the tool. The tool can be used by anyone without previous experience.

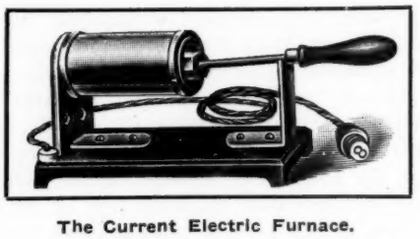
It will be evident that the force of the hammer blows will decrease in accordance with a decrease in the speed with which the machine is operated and the machine is thus under the absolute control of the operator without the necessity of stopping the work to adjust a tension spring. For example, when drilling a hole through a marble slab, a fairly heavy blow is required to go through the middle of the slab, but when working near the farther end, if the same speed were kept up, the force of the heavy blow would knock out the surface. To avoid this the operator gradually lightens his blows as he proceeds, by turning the crank more slowly.

These Drilhammers are made in two sizes and will accommodate drills from ¼ in. to 1¼ ins. in diameter. They are useful for any drilling work where pneumatic or electric power machines are not available. Extension attachments are provided to enable the tool to be used with ease in awkward positions where the machine cannot be conveniently held by the operator. Thus for ceiling work, the extension brace may extend to the floor or other point of rest enabling the operator to stand in a natural position. Any style of drill can be used with this tool and the machine can be carried conveniently in a regular tool kit. The Drilhammer is manufactured and sold by Orr & Lockett Hardware Co., Chicago.

Electric Furnace for Soldering Irons.

A new type of portable furnace for heating soldering coppers has been placed upon the market. It is an electric furnace and is designed to replace the gas furnaces which have so long been in use. The illustration shows one type of the furnace, which is made in three sizes. No. 1 is for heating coppers up to ½-pound. It has an inside diameter of 9/16 of an inch and is four inches in length; No. 2, which is shown in the illustration, is designed for heating coppers up to three pounds. It is 1⅜ inches in diameter inside, by 5 inches in length. The No. 3 size is oval in shape and is intended for heating two coppers, each up to four pounds. It is 4 ins. by 1½ ins. inside and 5 ins. in length.

The furnaces are provided with a cord and plug so that they may be attached to any electric lighting circuit, being supplied for any desired voltage. It is said that these furnaces use but a very small amount of current, thus making the operating expense quite low. The heating elements are guaranteed, when used on the circuits of the voltage specified. In addition to their portability, the use of these electric furnaces avoids the annoying delays caused by using gas and other similar types of furnaces with their accompanying odors and dangers.

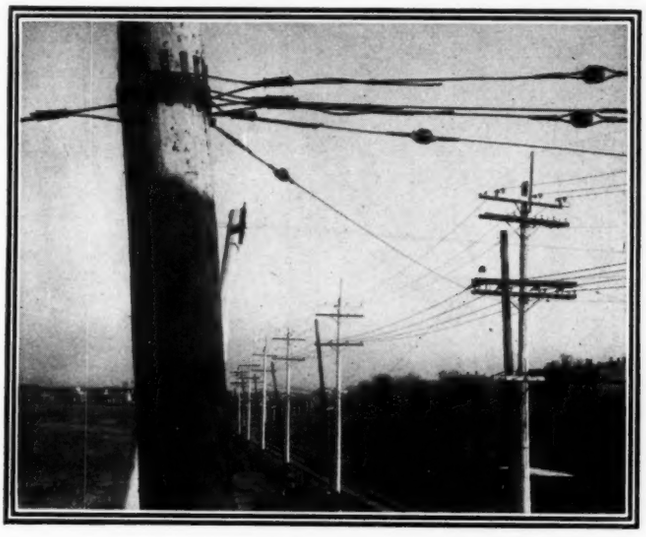


The Current Electric Furnace.

The Current Electric Co., 18 E. Kinzie St., Chicago, is the manufacturer of these furnaces and will be glad to send full information upon request.

Uses of Matthews Clamp Specialties.

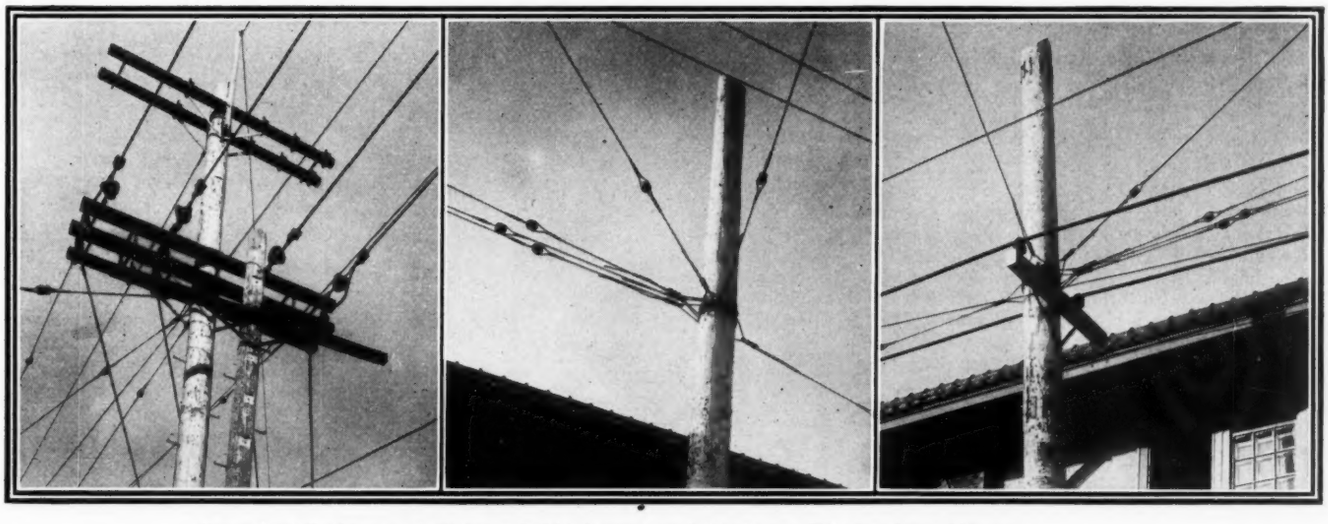
The accompanying illustrations are taken from photographs showing the installation of the Matthews boltless guy clamps and the Matthews cable clamps. Although the applications of



Matthews Boltless Guy Clamps.

these specialties are shown in connection with power and lighting construction, they illustrate the uses to which they can be adapted in telephone construction.

The view to the left of the group illustration shows four of the Matthews cable clamps used on the lead consisting of four No. 0 wires which will eventually have seven No. 0 and two No. 4 wires. The second view shows a group of the Matthews boltless guy clamps, while the third view of the same illustration shows six Matthews giant boltless guy clamps used on a main stub pole and holding part of the load of the curve which is shown in the view on the left. The remaining illustration shows the Giant boltless guy clamps in use on another part of the curve and gives a good view of the lead.



Some Installations of Matthews Cable Clamps and Matthews Boltless Guy Clamps.

When Stockholders and Subscribers Get Officious.

"No stockholders or renter of the Eureka Telephone Co. will be permitted to install a box or run a telephone line for this company without first consulting the board of directors," says an advertisement, signed by the board of directors of the Eureka Telephone Co., of Corydon, Ind., and appearing in the local papers of Corydon.

Harold Almert Engages in Consulting Engineering.

Harold Almert, consulting engineer, for the past five years manager of the department of examinations and reports of H. M. Byllesby & Co., has severed his connection with that firm to engage in consulting engineering practice on his own account, with offices in The Rookery, 209 So. La Salle St., Chicago.

Mr. Almert is just completing his twentieth year of active work in the organization, financing, design, construction, operation and management of public utilities, and for several years past, has valued or passed on investments for new projects, consolidations, reorganizations or extensions to existing properties of from one hundred to two hundred million dollars, annually.

In his practice before public utility commissions, which has extended from New York to California, he has handled many important rate cases, has served as arbitrator in a number of condemnations, and in these lines has established a new and important field of usefulness for the engineer with training in law and accounting, as well as technical training and experience.

As assistants, Mr. Almert will have associated with him a staff of well seasoned specialists in mechanical, electrical, gas and hydraulic engineering, appraisals, rate investigations, accounting and efficiency work who, by their training and years of experience, are experts in their lines.

Book Reviews.

PRACTICAL USES OF THE WAVE METER IN WIRELESS TELEGRAPHY, by J. O. Mauborgne; published by McGraw-Hill Book Co., Inc., New York. 74 pages, 6x9 ins., with 42 illustrations; price $1 net.

The text of this work was first prepared for use in the Army Signal School, Fort Leavenworth, Kans. It has since been carefully revised and in its present form is an excellent book for persons wishing to gain a knowledge of the latest developments in auxiliary apparatus used in the wireless art. It deals with the wave meter lengths as encountered in tuning wireless apparatus for working together.

Descriptions are given of the various types of wave meters such as the Pierce and Telefunken, used by the U. S. Signal Corps. The use of wave meters in measurement of wave lengths; in tuning the sending station; in the measurement of damping and logarithmic decrement; in measuring the wave length of the receiving station; and in measurement of capacity and inductance are fully explained. A technical knowledge of wireless is desirable in order to obtain the great-

est benefit from the book, as formulas are introduced to explain the various tuning or synchronizing applications.

The volume is really a hand book which may be intelligently used in the installation of a station.

AMERICAN ELECTRICIANS' HANDBOOK, by Terrell Croft; published by McGraw-Hill Book Co., Inc., New York. 711 pages, 4x6¾ ins., with illustrations and tables; leather bound; price $3 net.

This is intended as a reference book for practical electrical workers and as such it is well named, for the practical electrical man will find in it, not only the technical data which is necessary in every day electrical work, but also practical kinks regarding various methods of installing electrical equipment.

The book is divided into six sections under the headings of: Fundamentals, generators and motors, outside distribution, interior wiring, transformers, and illumination. The text has been prepared primarily for men of little schooling and therefore contains a great amount of practical information on materials, and suggestions for the selection, installation and operation of equipment, presented in such a form as to be readily grasped not only by the practical man but also by the technically trained man as well.

Contractors, wiremen, linemen, plant superintendents, operators and construction men will find the book of great value to them, as it contains so much practical matter exactly of the nature that will aid in their daily work.

Cedar Yards of the MacGillis & Gibbs Co.

The MacGillis & Gibbs Co., of Milwaukee, Wis., manufacturer of Idaho lumber, cedar posts, poles, ties and shingles, has issued a very effective yard-long photograph panorama of its cedar yards at Gladstone, Mich., showing the extensive stock carried by this company and the railroad side tracks entering the yard at either end.

U. S. Tests of Various Wood Preservatives.

In the January 10 issue of TELEPHONY there was published an article entitled "U. S. Tests of Various Wood Preservatives." This information was submitted by the Carbolineum Wood Preserving Co., but its publication was evidently an error on their part. In transmitting this information to TELEPHONY, on December 22, the Carbolineum Wood Preserving Co. said, in part:

Incidentally wish to say that we frequently receive inquiry from pole users asking us for the reason of higher price and difference between our goods and coal tar creosote, as is frequently recommended for wood preservation, and we enclose a copy of a recent report we received from the Forest Service at Madison pertaining to "Standard Tests of the Comparative Efficiency of Various Preservatives," this report showing the comparative volatility of Avenarius Carbolineum and coal tar creosote, which might perhaps interest your readers.

The Forest Products Laboratory has called the attention of the editorial department of TELEPHONY to the fact that the data given covers only one phase of the investigation, is entirely misleading, and was not approved for publication, as will be readily seen from the following correspondence which the laboratory had with the Carbolineum Wood Preserving Co. A letter by Howard F. Weiss, director of the Forest Products Laboratory, to the Carbolineum company, is as follows:

December 27, 1913.

Your letter of December 24, requesting additional blueprints of the volatility curves of Avenarius carbolineum is received.

We have made 10 or 12 tests on each preservative under Project L-117, and you will, no doubt, recognize the fact that any one of these tests taken by itself is not a measure of the efficiency of the preservative. The efficiency can only be judged by considering all the tests together, and giving to each test its proper weight. Our toxicity tests have shown that the toxicity of Avenarius carbolineum is lower than that of coal-tar creosote L-54, but the publication of this fact alone, of course, would not be fair, and it would be just as unfair to publish the results of the volatility tests alone.

It is our intention to publish the results of Project L-117 as soon as possible, and the progress reports should not therefore be published separately elsewhere.

The reply of the Carbolineum company to the foregoing letter follows:

Milwaukee, Wis., Dec. 30, 1913.

We have your favor of the 27th inst., in reference to tests made under your Project No. L-117, and duly note that you do not consider it fair that any of these tests be published separately. We fully agree with you in this matter, and as far as the volatility tests are concerned, you will appreciate it that we have made use of the data only where the volatility of Avenarius Carbolineum in comparison with creosote came into consideration. We shall, however, refrain from making use of these tests until the complete reports of Project L-117 are ready, and would, of course, appreciate it if you would send us copy covering the entire test in due course of time.

A letter to the U. S. Forest Service, written by the Carbolineum Wood Preserving Co. on January 21, contained the following paragraphs:

It is true we furnished them this information on December 22, being ignorant at that time that this report should not be used separately, as you indicated in your letter of December 27. and that this letter should have been timely enough to enable us to stop publication in TELEPHONY, issue of January 10.

Unluckily, however, our Mr. A. Leypoldt who, in fact, contemplated to do so, after writing you last on December 30, suffered an accident on this same day, which incapacitated him to return to the office and do so, and confined him to his home until January 9, thus this matter was entirely overlooked.

Under the circumstances, we hope that you will accept our humble apology for this occurrence, which we sincerely regret and assure you at the same time that hereafter we shall make it a point to communicate with you before making use of anything in any shape or manner pertaining to Project L-117, or any test made in co-operation.

Paragraphs.

UNION ELECTRIC Co., Pittsburgh, Pa., has issued some timely, illustrated folders calling attention to the Oshkosh anchors and the service given by them under storm conditions such as are now prevalent in some sections of the country.

FAIRMOUNT ELECTRIC & MFG. Co., 2203-05 Pearl Street, Philadelphia, Pa., is the manufacturer of the new "Aero" cable car which was illustrated and described in TELEPHONY of January 31. The company will be pleased to send literature in regard to this car upon request of those interested.

MCROY CLAY WORKS, The Rookery, Chicago, continues this year its standard form of blotter calendars, the February one containing the following: "Sometimes the gook who whimps that the world has given him a bum deal, has been too indolent to cut the cards."

THE ROME WIRE Co., of Rome, N. Y., has for its February calendar the second of an exceedingly artistic series. The calendars, which will be sent to telephone men upon request, are this year presented in colors and in addition to containing the monthly calendar, an attractive picture is shown. On the February calendar, the subject of the picture is "Under the Rose" and is so reproduced in colors that it forms a real addition to the decoration of the office.

W. COVERT JONES, who has been sales manager of the Union Electric Co., of Pittsburgh, Pa., has severed his connection with that company and has become district sales manager for the Chicago office of the American Ever Ready Co., manufacturer of Ever Ready batteries and flashlights. Mr. Jones was with the Union Electrie Co. for about 7½ years. He started as a salesman and was then brought in from the road to take charge of the city store, and was later appointed sales manager for the company

Legal Cases and Decisions

By A. H. McMillan

Protection from Possible Interference.

"We have a lead of telephone wires running along a 30-ft. public road, carrying two metallic and three grounded lines. Two and one-half miles out, one metallic and one grounded line leave the road—the other continues. Our wires are on the west side of the road except for about a quarter of a mile, four miles out. The electric light company is now constructing a bare wire circuit on the east side of this road to go out 4½ miles. This high power current, parallel to our lines, will be 22 to 30 feet distant, except for the quarter mile we are on the east side, at which place it will be 6 to 10 feet away.

"Can we prevent the lighting company from sending out this current under the above conditions? Can we recover damages? Can we make the lighting company pay the cost of adjusting our lines to this changed condition? Can you cite us to any law or court decisions in Florida whereby high power currents can legally be run along public highways in the state?"

You cannot prevent the lighting company from sending out this current under the conditions mentioned, unless you can show that the sending of such current by them is an interference with your line. If you can show that, you are entitled to an injunction to restrain them from continuing the interference and for any damages you may suffer therefrom. If you are compelled to adjust your lines to the changed conditions in order to prevent the interference, you can make that an element of damage suffered by you. We cannot cite you to any law or court decisions to the effect that high power currents can be had along any highways in the state and we know of no decisions to the contrary, except where the maintenance of such currents interferes with the property of others.

Between electric light companies and telephone companies, the one whose wires are first rightfully in position is entitled to protection against interference by induction on the part of the one subsequently erected. For any damages caused by induction, the later established company is liable, and the company injured is also entitled to an injunction to restrain the electric company from stringing its wires in proximity to those of the telephone company. Nebraska Telephone Co. vs. York Gas & Electric Light Co., 27 Nebraska, 284, 3 American Electrical Cases, 364.

The telephone company can obviate the serious effects of induction by increasing the distance between its wires and those of the electric company, as the effect of induction at a distance of 15 feet has been shown to be but slight, the rule being that induction between parallel lines is inversely proportional to the square of the distance between them. Where a telephone company can avoid induction by this means, it is its duty so to do. Rocky Mountain Bell Telephone Co. vs. Salt Lake City Railway Co., 3 American Electrical Cases, 356. McMillan on Telephone Law, Section 139.

Special Tax on Poles and Wires.

"Will you send us all the decisions which have been rendered by public utility commissions, railroad commissions, or similar boards, regarding the payment of a special tax to municipalities which have been exacted in addition to the regular property and franchise tax? The circumstances are that we have franchises in two municipalities that desire a special tax on poles and wires and we wish to combat them."

The following is a list of authorities that bear on this subject:

An ordinance imposing a tax of $2 a pole is valid against a company doing business under the Post Roads Act, Western Union Telegraph Co. vs. Richmond, 178 Federal, 310.

A license fee of $1 per pole, $1.50 a mile of wire, and $30 per mile of conduit is reasonable. In re Delaware & Atlantic Telegraph & Telephone Co.'s petition, 73 Atlantic, 175.

A tax of $1 on every pole is valid. St. Louis vs. Western Union Telegraph Co., 148 U. S., 92, 149 U. S., 465.

An ordinance imposing a pole license tax is not void because not restricted in express terms to poles and wires maintained upon highways and public property. Borough of Kittaning vs. Western Union Telegraph Co., 26 Pa. State, 346.

The municipality has no power to exempt telephone company from charges arising from the exercise of the police power. Radic Borough vs. Allegheny Telephone Co., 25 Pa. Superior Court, 544.

Ownership of road by turnpike company does not interfere with the borough's right to levy license tax on poles and wires. Norwood Borough vs. Western Union Telegraph Co., 25 Pa. Superior Court, 406.

Poles not subject to rental tax in Tennessee. Memphis vs. Postal Telegraph-Cable Co., 139 Federal, 707.

Validity of pole rental tax in Florida. Pensacola vs. Southern Bell Telephone Co., 37 Southern, 820.

Reasonable rental for pole. Memphis vs. Postal Telegraph-Cable Co., 164 Federal, 601.

Dangerous Interference from Electric Company.

"We are a small unincorporated telephone company of about 400 subscribers (mutual). Our lines are all grounded, and the switchboard is located in the city of Miles, Iowa, which is unincorporated. We have about 90 subscribers in this city and have been in business here for about 10 years. A certain party or parties are running an electric wire in this town for electric light purposes, bringing the current from Clinton, a distance of about 125 miles. What right have we as a telephone company, or have we none? The electric light company has a franchise from the city of Miles. Its poles are of the same height as ours and some of them are set alongside of ours. In fact, they had to dig the dirt away from our poles to set theirs. When the electric company strings its wires they will be together with ours. What will be right and just for me as manager of the telephone company to do? Can I do anything?"

Under the circumstances we think you are entitled to restrain the electric company from interfering with your wires and poles. The situation as you describe it, will apparently be very dangerous. The fact that the electric company has a franchise does not give it any right to damage others, whether the others have or have not a franchise. The rule is that between electric light companies and telephone companies, the one whose line is first rightfully in possession, is entitled to protection against interference by induction on the part of the line subsequently erected. For any damages caused by induction, the later established company is liable, and the company injured is also entitled to an injunction to restrain the electric company from stringing its wires in proximity to those of the telephone company.

Prior authority to occupy, or prior occupation of the streets, does not confer upon such company any exclusive right, but any subsequently licensed company is under the duty to so maintain its wires and lines as not to interfere with the prior occupant's right to properly operate its lines, and to transact a lawful business. Nebraska Telephone Co. vs. York Gas & Electric Co., 27 Neb., 284, 3 American Electrical Cases, 364, McMillan on Telephone Law, Section 139.

Guard Wires.

Where the telephone and city electric light wires cross, the duty rests equally upon the telephone company and the city, in so far as third persons are concerned, to place a guard wire or other device to prevent contact between the two wires, in case they fall. So the Supreme Court of Mississippi held in an action brought against a telephone company and the city of Brookhaven for the death of a telephone lineman.

It was also held that it was the duty of the telephone company to instruct the lineman relative to the dangers incident to his work because of his inexperience, which was known to the company.

He had been working for the telephone company as a lineman and troubleman for not more than two and one-half months, including several weeks during which he served without pay as an apprentice, in order to learn the business. At the time he entered the companys employ as an apprentice, he was wholly without experience in this line of work. He was placed under the supervision of an employe of the company, a lineman, from whom he received whatever instruction he got relative to his duties and the danger incident thereto.

The cause of the fall of the wires was that the telephone wires were so negligently fastened to their support that, when they were struck by a flying pigeon, they fell and came in contact with the electric light wires. Cumberland Telephone & Telegraph Co. vs. Cosnahan, 62 Southern, 824.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

FRANK J. ANDERSON, local manager for the Wisconsin Telephone Co., at Lancaster, Wis., has resigned and will be succeeded by Everett Comeford, of Madison.

E. E. MICHAEL, local manager for the Michigan State Telephone Co., at Sault Sainte Marie, Mich., has been promoted to the position of district manager with headquarters in that city.

C. M. DARLING, formerly commercial agent for the Michigan State Telephone Co., at Jackson, Mich., has been appointed resident manager of the Lansing exchange, to succeed B. R. Marsh, who has been promoted to district manager.

F. G. ADAMS, JR., district engineer of the Chesapeake & Potomac Telephone Co., with offices in Hagerstown, Md., has been transferred to the Cumberland Telephone & Telegraph Co., of Nashville, Tenn., in the capacity of plant wire chief.

WILLIAM R. ENO, for several years commercial manager of the New Rochelle, N. Y., district of the New York Telephone Co., has been promoted to the position of commercial manager of the Yonkers district, where he will have charge of a much larger territory.

New Companies and Incorporations.

BRYANT, IND.—The Peoples Telephone Co. has been incorporated with $8,000 capital stock by J. Rupel, P. L. Treece and G. G. Montgomery.

MARIETTA, OHIO.—The Washington Telephone Co. has been incorporated with $300,000 capital stock by F. L. Alexander, B. L. Bullman, G. J. Lund, H. H. Miller and W. S. Plumber.

CHESTER, OKLA.—Articles of incorporation have been filed by the Farmers' Mutual Telephone Co. with $1,000 capital stock. The incorporators are Thomas Green, A. H. Ezell and R. H. Gasswint, all of Chester.

PERRY, OKLA.—The Lone Elm Farmers Telephone Co. has been incorporated with $1,000 capital stock by Peter Ewry, J. W. Ruth and John Ritthaler, all of Perry, R. F. D. No. 4.

YELTON, OKLA.—The Hanzel Telephone Exch. has been incorporated with $340 capital stock by Larkin Haynes and Otto Stanley, of Gate, and J. W. Blanchard and O. H. Jones, of Yelton.

HARBOR, ORE.—Articles of incorporation have been filed by the Chetco Farmers Co-operative Telephone Co. with no capital stock. The incorporators are N. B. Moore, F. M. Gruver, H. R. Hartley, John Bravo, C. Bravo, M. Wood, J. M. O. Mossison, J. De Martin, N. W. Moore, George Tolman, Wm. Clark and Alfred Jackson.

PRINEVILLE, ORE.—The Rye Grass Telephone Co. has been incorporated with $4,800 capital stock by Fred Grimes, N. G. Wallace, C. L. Lundquist and Price Coshow.

CRIVITZ, WIS.—The Crivitz Rural Telephone Co. has filed articles of incorporation with $10,000 capital stock. The incorporators are C. A. Correll, J. T. Ahle, W. A. Smith, G. Meyer, J. Tassell, C. Boehmke, J. Corstens, J. O. Rollins, David P. Teeple, W. Hotzel, Theo. Kersten and J. P. Durler, all of Crivitz.

Construction.

MUNCIE, IND.—Local Manager E. E. Springer, of the Central Union Telephone Co., has announced that approximately $75,000 will be spent in improving the rural and local service in his district.

FREELAND, MICH.—The Beverly Telephone Co. which took over the Freeland Telephone Co.'s system, will expend $2,000 in new cable and other improvements, one of them being a switchboard of greater capacity.

LEXINGTON, MO.—E. D. Graham, owner of the Lexington Telephone System, has announced that a new fireproof exchange will be erected in the near future.

DEMING, N. M.—The Mountain States Telephone & Telegraph Co. is rapidly extending its telephone system in southwestern New Mexico, having just completed a line between Deming and Rincon. Work will be started soon on a line from Deming to Columbus.

TEMPLE, TEX.—The United Telephone Co. is making improvements and enlargements to its plant here at a cost of $3,000. The switchboard will be enlarged and new cables strung.

Franchises.

SILVIS, ILL.—The village board has granted permission to the Tri-City Automatic Telephone Co., with headquarters at Davenport, Iowa, to establish an exchange in Silvis.

EAST SYRACUSE, N. Y.—A telephone franchise has been granted by the village trustees to a company headed by Wm. W. Bush and the Business Mens' Association.

Financial.

SHELTON, NEB.—The Farmers' Home Telephone Co. has declared a 10 per cent. dividend.

HILLSBORO, N. D.—The Traill County Telephone Co. has declared its annual dividend of 8 per cent.

ATHENS, OHIO.—The Athens County Home Telephone Co. has increased its capital stock from $100,000 to $150 000.

OLD FORT, OHIO.—The Old Fort Mutual Telephone Co. has declared an annual dividend of 6 per cent.

DEADWOOD, ORE.—The Blachly & Deadwood Telephone Co. has filed an amendment to its articles of incorporation, increasing its capital stock from $1,000 to $5,000. M. P. Wheeler is secretary of the company.

MEYERSDALE, PA.—At the annual meeting of the Economy Telephone Co., a 5 per cent. dividend was declared.

CUMBERLAND, WIS.—The McKinley Telephone Co. declared a dividend of 8 per cent. at its annual meeting which was held recently. The company is in a prosperous condition and has made arrangements for a number of extensions and improvements during the ensuing year.

Elections.

ALHAMBRA, ILL.—At a recent meeting of the Alhambra Mutual Telephone Co. the following officers were elected for the ensuing year: President, C. Warber; vice-president, Wm. Brumworth; secretary, E. H. Henschen; treasurer, Wm. H. Beckmann.

ERIE, ILL.—At the annual meeting of the stockholders of the Crescent Telephone Co. the following officers were elected for the ensuing year: Geo. W. McMurphy, of Hillsdale, president; E. L. Hanson, treasurer; J. M. Martin, vice-president; and A. A. Mathews, secretary.

MACOMB, ILL.—The third annual meeting of the stockholders of the Macomb Telephone Co. was held recently and the following directors were elected: C. K. Todd, A. A. Messmore, J. H. Hungate, H. L. Argenbright, E. S. Slusher, C. M. Stairwait, W. A. Binnie. After the meeting the directors held their election of officers for the coming year, which resulted: President, C. K. Todd; vice-president, H. L. Argenbright; treasurer, A. A. Messmore; and manager, E. S. Slusher.

BOWLING GREEN, IND.—The Bowling Green Telephone Co. has elected officers for the ensuing year as follows: B. F. Talbott, president; Wilmer Buell, secretary, and Samuel B. McCann, treasurer.

HILLSBORO, IND.—The Merchants & Farmers' Telephone Co. held its annual meeting recently and elected the following directors: David Meyer, Lewis Starnes, Sr., Virgil Frazier, George Hesler, Wm. Epperson, Valmar McKnight, James Laird, J. D. Lindville and Dr. A. D. McKey.

PLEASANTVILLE, IND.—The Pleasantville Telephone Co. has elected the following officers for the ensuing year: Hugh Rose, president; J. A. Payne, vice-president; W. L. Long, recording secretary; B. S. Booker, financial secretary; J. W. Bishop, treasurer; J. H. Clarke, trustee.

CINCINNATI, IOWA.—The Mutual Telephone Co. held its annual meeting recently and elected the following officers and directors for the ensuing year: President, J. M. Hoover; vice-president, A. W. Carr; secretary, Nancy Ellis; treasurer, J. V. Leseney; directors, W. G. Bozwell, Edward Gault, Loge McClure, C. H. Meyers and C. A. Leseney.

CRESTON, IOWA.—The stockholders of the Creston Mutual Telephone Co. held their regular annual meeting recently at which the following officers were re-elected for the coming year: President, J. C. Sullivan; vice-president, Scott Skinner; secretary and general manager, Geo. E. Atkinson; treasurer, W. H. Brady. The following constitute the board of direc-

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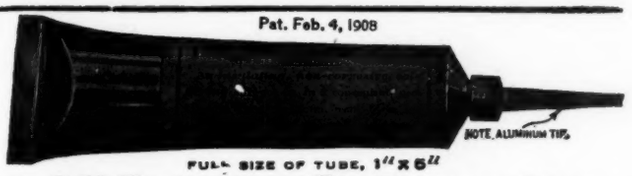

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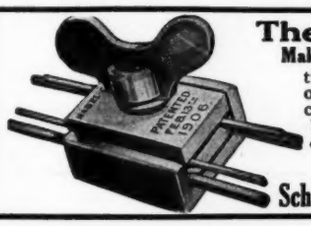

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tors: J. C. Sullivan, Scott Skinner, Geo. E. Atkinson, A. Mallory, W. H. Brady and C. J. Atkinson.

MACEDONIA, IOWA.—The stockholders of the Macedonia Telephone Co. held their annual meeting recently and re-elected the directors as follows: P. W. Frederickson, Harvey Bolton, Willoughby Dye, T. A. Hougas, C. C. Scott. Immediately after the adjournment of the stockholders' meeting the directors held a meeting and elected officers as follows: President, T. A. Hougas; vice-president, Harvey Bolton; secretary and manager, W. P. Dinwiddie; treasurer, Willoughby Dye.

TROY, IOWA.—At the annual meeting of the Troy Telephone Co. the following officers and directors were elected for the ensuing year: President, Dr. Garrett; vice-president, Jerry Mustard; secretary, S. E. Pearsall; treasurer, V. L. Law; directors, Willis Loar, Fred Glattfeldter, Ora Townsend and I. C. Evans.

ASSARIA, KANS.—At the annual meeting of the stockholders of the Assaria Mutual Telephone Co., the following officers were elected; Harry Perrill, president; W. O. Tinkler, vice-president; E. B. Erikson, secretary; John C. Short, treasurer.

HIAWATHA, KANS.—At the annual meeting of the stockholders of the Hiawatha Mutual Telephone Co. the following were elected members of the board of directors: Frank Shaw, C. O. Dimock, A. C. Dannenberg and R. V. Brokaw. Immediately after the stockholders' meeting, the directors met and elected the following officers: William Morisse, president; J. G. Kale, vice-president and manager; J. D. Weltmer, secretary, and C. O. Dimock, treasurer.

MCCUNE, KANS.—At a meeting of the stockholders of the McCune Telephone Co. the following officers were elected for the ensuing year: President, Thos. C. Fair; vice-president, W. T. Highland; treasurer, Fred Colburn; superintendent, T. R. Landes. The directors of the company are: Dr. D. A. Walker, G. P. Roberts and Edward Munday. The company is planning to string about 2,000 ft. of aerial cable in the near future.

OKETO, KANS.—The stockholders of the Oketo Mutual Telephone Co. held their annual meeting recently and elected officers for the current year as follows: William E. Smith, president; Artie Cottrell, vice-president; J. H. Moore, secretary, and R. Bull, treasurer.

SKOWHEGAN, MAINE.—At the annual meeting of the Somerset Farmers Co-operative Telephone Co. the following officers and directors were chosen for the ensuing year: J. W. Packard, Skowhegan, president; S. H. Beal, Skowhegan, treasurer; George H. Foster, Canaan; W. C. Hobart, Skowhegan; L. F. Boardman, Solon; J. W. Packard, Skowhegan; H. B. Whipple, Bingham; Ansel Holwam, Norridgewock, and R. H. Ellis, North Anson, directors.

BRONSON, MICH.—At the annual meeting of the Bronson Mutual Telephone Co., the following officers were elected for the coming year; President, Ambrose Bushnell; vice-president, Frank Martin; treasurer, L. P. Hansen. The following directors were also chosen: John Shaffmaster, John Shurtz, L. T. Sackett and Wm. Smith.

SAGINAW, MICH.—The annual meeting of the stockholders of the Valley Home Telephone Co. was held recently at which the following directors were elected: W. F. Hemmeter, Hilem F. Paddock, R. F. Johnson, C. O. Trask, Saginaw; C. B. Curtiss, L. G. Beckwith, Omer J. Morton, James C. McCabe, Bay City; Henry Martini, Sebewaing; J. P. Gibbs, Ithaca; G. G. Ward, Alma.

SPRINGPORT, MICH.—At the annual meeting of the Springport Telephone Exch. the following trustees were elected to serve during the ensuing year: Frank Hardt, Frank Sheres, F. E. Powers and W. H. West. The reports showed that the company is in a flourishing financial condition.

ST. JOHNS, MICH.—At the second annual meeting of the Clinton Telephone Co. the following officers were elected: President, Leslie G. Brown, St. Johns; vice-president, W. T. Plowman, Bengal, Minn.; secretary and treasurer, Arthur L. Tripp, St. Johns. The directors are as follows: Henry Lindsay, Greenbush; D. R. Sturgis, Bengal, Minn.; W. L. Rosekrans, Traverse City, and Charles Travis, Traverse City.

WARRENSBURG, MO.—The stockholders of the Johnson County Home Telephone Co. held their annual meeting recently at which officers were elected for the coming year as follows: W. J. Mayes, president; Nels Abraham, vice-president; James H. Lampkin, secretary; H. C. Houston, general superintendent. J. Wesley Stone, Harry T. Clark, W. C. Knapp, C. J. Rucker, C. T. Malcomson, A. M. Craig were elected directors.

ANSLEY, NEB.—At the annual meeting of the Ansley Telephone Co. the following directors were elected: John McCullough, T. C. Berry, John Staab, U. G. Brown, T. S. Hayes, C. J. Stevens and C. Mackey.

ELLENDALE, N. D.—The Dickey County Mutual Telephone Co. held its annual meeting recently at which the following officers and directors were elected for the coming year: President, Adam Schweitz; treasurer, Jacob Lay; secretary, Gott Wendland; directors, J. G. Schultz and Jacob Rutsche.

CATO, N. Y.—The annual meeting of the stockholders of the Cato & Meridian Telephone Co. was held recently at which the following board of directors was chosen: G. L. Applegate, William Olmstead, James Mehan, Edward Kennedy, W. B. Sprague, William W. Legg, Jr., W. L. Cornell, Frank Sudro and C. D. Jones.

PENN YAN, N. Y.—The stockholders of the Milo Telephone Co. held their annual meeting recently and elected the following directors: J. J. Gardner, Dr. F. H. Smith, Elmer J. Schofield, H. C. Longwell, A. E. Gardner, S. F. Swarthout and M. L. Spooner. The directors organized by electing the following officers for the ensuing year: President, J. J. Gardner; vice-president, Elmer J. Schofield; secretary, M. L. Spooner; treasurer, A. E. Gardner.

OLD FORT, OHIO.—The annual meeting of the stockholders of the Old Fort Mutual Telephone Co. was held recently at which the directors were re-elected. The officers are: President, R. G. Shannon; vice-president, Leander Myers; secretary, C. I. Anders; treasurer, C. J. Fry. The officers, together with C. A. Nease, C. C. Drown and R. H. Crum constitute the board of directors.

MARIETTA, OHIO.—The stockholders of the Washington Telephone Co., which has taken over the Marietta Telephone Co., met recently and elected the following directors: B. L. Bullman, G. J. Lund, H. H. Miller, F. L. Alexander and W. S. Plumer, after which the directors chose the following officers: B. L. Bullman, president and general manager: G. J. Lund, vice-president; W. S. Plumer, secretary, F. L. Alexander, treasurer.

WOOSTER, OHIO.—At the annual meeting of the Wayne County Telephone Co. the following directors were chosen to serve for the coming year: A. W. Metcalf, W. A. Craig, S. E. Raudebaugh, John Leichty, Daniel Graber, J. P. Garrett, G. B. Barnard, S. G. Spangler, J. E. Elling, D. W. Frase, John Steiner, Rubin Rebman, A. L. Thompson, Henry Metcalf and Laird, J. D. Lindville and Dr. A. D. McKey.

SOMERSET, PA.—At the annual meeting of the Somerset County Telephone Co. the stockholders elected the following directors: E. D. Schade, Charles Griffith and J. M. Murdock, of Johnstown, Josiah Swank and Attorney F. W. Biesecker, of Somerset; Irwin M. Hoover, of Hooversville, and William B. Cook, of Meyersdale.

YORK, PA.—At the annual meeting of the stock holders of the York Telephone & Telegraph Co. the following board of directors was elected for the ensuing year: Hon. D. F. Lafean, H. H. Weber, John McCoy, C. C. Frick, Dr. William S. Eisenhart, George B. Rudy and Harry S. Weist. Immediately after the stockholders meeting the newly elected board organized as follows: President, C. C. Frick; vice-president, D. F. Lafean; secretary, H. H. Weber; treasurer, H. H. Weber; general manager, George B. Rudy; superintendent, H. L. McNeal.

TREZEVANT, TENN.—The Trezevant Telephone Co. held its annual meeting recently and elected the following board of directors: E. T. Baker. W. A. Youngey, J. H. Quinn, J. W. Kennon and Elbert Ethbridge. The officers were all re-elected as follows: President, C. C. Sloan; vice-president, J. L. Cochran; treasurer, W. J. Quinn; secretary, Dr. J. G. Holmes. B. C. Lundy was chosen manager.

Underground.

BARTLESVILLE, OKLA.—The Pioneer Telephone & Telegraph Co. has made an appropriation of $40,000 for improvements and extensions to its plant in this city. A large portion of this money will be spent in placing wires in cables or underground.

SCRANTON, PA.—The Bell Telephone Co. of Pa. will commence work shortly on extensive improvements to its local plant. Among the improvements planned about $5,000 will be spent in laying underground cable and placing open wires in aerial cable.

Miscellaneous.

LONG LAKE, MINN.—The Hennepin Telephone Co. has been sold by J. C. Hursh to Emery H. Reynolds, for $8,000.

CRIVITZ, WIS.—The Farm & Village Telephone Co. has filed a notice of dissolution, its lines having been purchased by the newly organized Crivitz Rural Telephone Co.